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**REDEFINING INTERACTION IN OPEN AND DISTANCE
LEARNING WITH REFERENCE TO TEACHER EDUCATION
PROGRAMMES IN THE UNIVERSITY OF THE WEST INDIES**

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**to the Institute of Educational Technology, The Open University
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ABSTRACT

Redefining interaction in open and distance learning with reference to teacher education programmes in the University of the West Indies.

Olabisi I. Kuboni

This study was undertaken to serve two purposes. At a theoretical level, it was undertaken to review the concept of interaction in open and distance learning (ODL). The decision to conduct this review grew out of a concern that the current dominant approach to the study of teaching and learning in ODL was focusing on social interaction. This was regarded as a restricted interpretation of the concept, hence the decision to review and revise.

At a subsidiary level, the study was aimed at examining teaching and learning in the current teacher education programmes of the University of the West Indies. This aspect of the study was undertaken in light of the university's proposed expansion of these offerings in the distance mode. The concept of interaction was seen as the appropriate context for undertaking this examination.

Based on a review of the literature, a revised concept of interaction was developed, embodying three separate, yet interrelated types, namely social interaction, learner-media interaction and learner-knowledge interaction. In developing this concept, attention was also paid to the part played by power relations and knowledge from external sources in the functioning of the concept's component parts. It is this reformulated concept that provided the theoretical framework for the examination of the teacher education programmes mentioned above.

A research programme comprising two sub-studies was designed and implemented. The first sub-study was an exploratory survey based on selected attributes of social interaction and designed to examine student teachers' perception of their experience as learners. The second was an observation study based on the principles of learner-knowledge interaction and aimed at investigating student-teachers' knowledge-building

processes as these revealed themselves within the interpersonal interaction of teachers and learners in an audio-conferencing environment.

A key feature of the observation study was the design and implementation of an interpretive framework to guide data analysis. The framework was developed out of the data themselves and comprised two sets of interrelated categories, the one classifying knowledge-building activities and the other, control management functions. Extended data analysis drew on selected aspects of discourse analysis and specifically on the work of Fairclough (1989, 1992) and Potter and Wetherell (1987).

The findings derived from the two sub-studies underscored the essential thesis of this study that interaction in distance education is best viewed as a multifaceted phenomenon, and that there is a functional interrelationship among the constituent parts of the concept.

The research programme also confirmed the constructivist thesis that people construct rather than acquire knowledge. At the same time, the findings seem to indicate that the imbalance in the power relations between teachers and learners can hinder learners' capability to derive meaning from their learning. The findings also suggest that student-teachers are ambivalent about their roles as learners and that this ambivalence seems, at times, to be reflected in the attempts they make to gain control of the teaching-learning situation and to direct their knowledge-building activities.

The study proposes specific areas of further research, including a follow-up study to test and refine the interpretive framework used in the observation study, and another to assess the validity of the three-part concept of interaction formulated in this work.

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TABLE OF CONTENTS

Abstract	i
Acknowledgements	iii
Table of Contents	v
List of Tables	xiii
List of Figures	xiv
List of Appendices	xv
CHAPTER 1	
DEFINING THE BOUNDARIES OF THE STUDY	1
Introduction	1
Interaction: a conceptual shift	3
Interaction in a mass production system	3
The interpersonal focus	3
Parallel changes.....	4
Towards a more robust conceptual framework.....	7
Distance education in UWI	8
The demand for teacher education programmes	10
A comparative perspective	13
Aims of the study	14
Structure of the thesis.....	15
CHAPTER 2	
INTERACTION AS A SOCIAL PHENOMENON	17
Introduction	17
A definition	17
Studying the communication	18
Relevant factors.....	19
Summary discussion	21

Collaborative Learning	22
The role of the group	22
Active/interactive learning	24
Linking the social and the cognitive	25
The social and the cognitive in practice	25
Learning: individual or collective activity?	27
Power and control	27
Summary discussion	28
Dialogue	29
A definition	31
Dialogue in practice	32
Specific applications	34
The practitioners reflect	36
Assessment of dialogue in practice	37
Summary discussion.	39
Learner autonomy within social interaction.....	40
Learner control model.....	40
Independent interaction.. ..	43
Summary discussion	45
Conclusion	46

CHAPTER 3

INTERACTION: A HISTORICAL PERSPECTIVE	47
Introduction	47
A theory of interaction	47
The 'simulated' and the real.....	48
Interaction with one-way media.....	48
Interpersonal Interaction	52
Summary discussion	55

Transactional distance	56
Empirical study	57
Summary discussion	58
Revisiting the theory of interaction.....	59
Two contexts for interaction.	59
Three types of interaction.	60
Critique of Bates and Moore.....	61
Conclusion	63

CHAPTER 4

LEARNER-MEDIA INTERACTION	65
Introduction	65
An interpretation	65
Media influence on learning: a debate	66
Summary discussion	68
Learning in interactive technological environments	68
Synchronous interaction	70
Perceptions about synchrony	75
Asynchronous interaction	76
Summary discussion	81
Media classification based on Conversational Framework.....	81
Overview of Conversational Framework	82
Critique of classification scheme	84
Critique of Framework	85
Conclusion	87

CHAPTER 5

LEARNER-KNOWLEDGE INTERACTION	89
Introduction	89
An interpretation	90
Learning as conversation	90
Learning conversation	90
Summary discussion	95
Constructivism	96
Analysing the concept	96
The concept in practice	98
Critique of constructivism.....	102
Greater bias towards the social	105
Language in knowledge construction	106
Summary discussion	110
Knowledge in professional education	112
Types of knowledge	112
Experiential learning	116
Reflection-in-action	119
Summary discussion	122
Power and control in teaching and learning.....	123
Power in the discourse	123
A critical theory perspective	124
Summary discussion	126
Conclusion	127

CHAPTER 6

THE RESEARCH PROGRAMME	129
Introduction	129
Theoretical framework	129
The research rationale	133
The two sub-studies	135
The exploratory survey	135
The observation study	136
The relationship between the two sub-studies.	138

CHAPTER 7

THE RESEARCH METHODOLOGY	139
Introduction	139
The exploratory survey	139
The instrument	139
Context of the survey	143
The Procedure	144
Data Analysis	144
The observation study	145
Context of the observation study.	146
Data collection procedures	154
Conducting the observation	159
Conducting the interviews	165
Evaluation of fieldwork	168
Data analysis for observation study	172
Overview of the data analysis process	172
The analytical tools	173
The interpretive framework	174
Extended data analysis	187
The transcription format.....	192

Terminology	193
-------------------	-----

CHAPTER 8

STUDENT-TEACHERS' PERCEPTIONS OF THEIR EXPERIENCE

AS LEARNERS	194
Introduction	194
Findings	195
Subtest 1: Talking with lecturers	195
Subtest 2: Which settings are most useful for which learning tasks?	197
Subtest 3: Taking responsibility for your own learning.	203
Emergent Issues	211
Ambivalence	211
Preferred settings	211
Tension in self-definition	213
Conclusions	215

CHAPTER 9

THE INTERPRETIVE FRAMEWORK: BUILDING

THE CATEGORIES	216
Introduction	216
Overview of observation study	216
The interpretive framework	217
Knowledge-building categories	218
Summary of knowledge-building categories	234
Control management categories	234
Summary discussion of emergent issues	240

CHAPTER 10

BUILDING THE KNOWLEDGE BASE.....	242
Subsidiary research question:.....	242
Introduction	242
The lecture presentation	243
What is transmitted... ..	244
... and what is assimilated	246
In search of meaning	249
Conflicting conceptions	252
Summary discussion	253
Internal negotiation	253
The struggle within	256
A shift in perspective	257
Other issues	258
Summary discussion	259
Building knowledge from an argument	260
Constructing the argument	261
Responding to the argument	263
Summary discussion	265
Critical analysis.....	265
Learner response to task.....	267
Learner performance of task	269
Task-related skills and mental models	270
Participating in the academic discourse	271
Summary discussion	274
Conclusion	275

CHAPTER 11

DEVELOPING THE SKILLS FOR CLASSROOM PRACTICE	278
Subsidiary research question:.....	278
Introduction	278
Problem-solving processes	278
The student-generated problem.....	279
The lecturer-generated problem	285
Summary discussion	291
Processes for introducing new methods	292
Mixed messages	293
Exploiting the ambivalence.....	294
Effecting the change.....	296
Summary discussion	300
Conclusion	300

CHAPTER 12

LOOKING BACK TO GO FORWARD	302
Introduction	302
Concept-building.....	302
Research design and implementation.....	307
Evaluation of practice	312
Conclusion	317

REFERENCES.....	318
-----------------	-----

APPENDIX 1

APPENDIX 2

APPENDIX 3

LIST OF TABLES

Table Number	Title	Page Number
Table 2.1	Baynton's enhanced model of learner control	42
Table 7.1	Procedure for doing subtest	141
Table 7.2	Examples of learning tasks	142
Table 7.3	Abbreviated version of Carter's taxonomy	184
Table 8.1	% frequency distribution of selected items of Subtest 1	196
Table 8.2	Overview of most and least useful settings for all four categories of tasks	198
Table 8.3	Choice of most useful settings for studying the course content	201
Table 8.4	Choice of most useful settings for project work	203
Table 8.5	Frequency distribution for selected items of Subtest 3	204
Table 8.6	Attributes of power	206
Table 8.7	Facilitating and hindering external factors	209
Table 9.1	Overview of knowledge-building categories	234

LIST OF FIGURES

Figure Number	Title	Page Number
Figure 6.1	A revised concept of interaction for open and distance learning	133
Figure 7.1	Layout of audioconference site	149
Figure 7.2	The interpretive framework	181
Figure 8.1	Display of choice of settings for all tasks	199

LIST OF APPENDICES

- | | |
|------------|---|
| APPENDIX 1 | Questionnaire used in exploratory survey |
| APPENDIX 2 | Classification of teacher-learner knowledge-building discourse
(pre-observation study training exercise) |
| APPENDIX 3 | Correspondence pertaining to observation study |

CHAPTER 1

DEFINING THE BOUNDARIES OF THE STUDY

Introduction

In response to the demand for increased provision of higher education in the Caribbean, the University of the West Indies is currently expanding its teaching programme to incorporate distance education and, in the process, to transform itself into a mixed mode institution, combining distance and face-to-face teaching. Teacher education has been targeted as one set of programmes to be delivered through distance mode. It is envisaged that the transition to distance education would involve not only an increase in the size of the population targeted, but also an expansion and enhancement of the programmes offered. In this expansion, the university, and in this context, its Faculty of Education, needs to address the issue of the quality of what is being offered, given the emphasis currently being placed on sustainable professional development by governments and other agencies with responsibility for educational provision (to be addressed more fully later). Quality in terms of the overall distance learning experience is itself a multi-faceted issue. For the purpose of this study, I have chosen to look at quality in relation to the actual teaching-learning processes, in order to analyse how these processes impact on what and how student-teachers learn. Perraton (1993), in his appraisal of the status of teacher education in several countries, makes a very pertinent observation in this regard. He states,

Society has steadily expected more of teachers in the variety of tasks they have to perform, in the skills they need to master and in the imagination required for their work. ... Quality matters as well as quantity. To do their job well, teachers need to possess a mastery of the subject matter they are to teach and to be skilled in the process of teaching....(p.1)

One objective of this study therefore was to examine teaching and learning in the current teacher education offerings of the Faculty, in order to assess the faculty's preparedness for its proposed distance-taught teacher education programmes.

In distance education, teaching and learning have been conceptualised as an interaction between distance teachers and learners. This emphasis on interaction has been all the more pertinent given the need to minimise the effect of the physical separation of the learner from the teaching institution. However, perspectives of what constitutes interaction have not remained constant over time. At an earlier period, the focus was on combining the 'simulated' and the real: the 'simulated' aspect was designed into the pre-packaged materials, and the real was provided through tutorials, conducted through correspondence, telephone or face-to-face. Within recent times, however, the emphasis has been on interaction as direct interpersonal contact between teachers and learners and among the learners themselves. This development was significantly influenced by the emergence of the new interactive telecommunications and computer-networked technologies. In practice, both the earlier and the more recent treatments of the concept exist side by side but it is the more recent social, interpersonal perspective that currently receives most attention as an area of study.

Notwithstanding differences in perspective, there is wide consensus in the field that interaction allows for a meaningful analysis of teaching functions in relation to learning functions. The analysis of teaching and learning processes within the teacher education offerings mentioned above, was undertaken in the framework of this concept, given my own agreement with the position outlined above. However, as a forerunner to this analysis, there was also need to re-examine the concept itself, particularly in the light of the perceived conceptual shift from the 'simulated'-real orientation towards one that focuses exclusively on interaction as an interpersonal, social phenomenon.

In light of the above, this study was undertaken to re-examine the concept of interaction, and in that context to pay attention to teaching and learning processes in the teacher education offerings of the University of the West Indies.

Interaction: a conceptual shift

The current focus on interaction as a social phenomenon represents a fundamental shift in the approach to viewing teaching and learning at a distance and it would appear that this shift is mirrored in parallel changes in the theory and practice of distance education as a whole. This section provides an overview of the shift in the interpretation and application of the concept of interaction and briefly examines the theoretical environment in which this change has been taking place.

Interaction in a mass production system

The period of the late 1960s and early 1970s saw the emergence of the dedicated distance education institutions catering to the needs of a mass student population that was geographically dispersed. The type of delivery system that was developed to meet those demands has been described by Peters (1967) as industrialised distance education. Distance educators, functioning within that system, have been sensitive to the need to counteract the increased distancing effect arising from the high level of standardisation that is required in such large scale provision. There have been important initiatives in the design of course materials aimed at enhancing learner engagement with the materials and, simultaneously, simulating two-way communication between the learner and the distant teaching institution.

Accompanying and supporting this focus on the design of interactive course materials, is a tutorial component conducted through correspondence, telephone or in the face-to-face mode. It must be noted though that in this industrialised paradigm, interpersonal contact occupies a subordinate position to the course materials.

The interpersonal focus

With the emergence of the interactive telecommunications and computer-based technologies, it is social interaction that is being emphasised. The intention of practitioners functioning within this paradigm is to maintain high levels of direct

person-to-person contact between teachers and students and among the students themselves.

Accompanying this orientation towards the social is a corresponding emphasis on the need for adjustments in teacher-student relationships, and for the role of the student to be enhanced in relation to that of the teacher. Thus learners are seen to be capable, or at least potentially capable of assuming initiating roles in the teaching-learning situation and teachers are seen as facilitating rather than directing the interaction.

The design of course materials is not given much prominence. One noted advocate of this social dimension states quite clearly that "a student interacting only with course materials does not ensure, or make probable, an educational experience". He asserts further that "education is a social, not a private activity", a perspective which he justifies on the grounds that learning "ultimately demands critical analysis and testing of understanding to avoid ideology and indoctrination" (Garrison, 1990, p.16).

What is evident, therefore, is that in at least some sectors of the field, there has been a significant shift away from a view of learning in distance education as an experience in which learners work for the most part in isolation from other learners and the teachers, to one which views the practice as requiring a high level of interpersonal interaction.

Parallel changes

As noted earlier, this movement towards the social has been occurring in parallel with other changes in the study and practice of distance education. In one school of thought distance education systems have been classified into three distinct generations, and in another, there are projections for a movement from fordism to post-fordism.

The three generations

Nipper (1989) sees media as an important defining characteristic of the practice of distance education and it is this component that he uses to evaluate and classify

distance education systems. He has identified three generations of distance education systems. The first refers to the correspondence tuition system that was based exclusively on print and in which all communication took place through the postal services. The second generation system refers to the practice that is based on a combination of one-way media and includes broadcast as one delivery mode. This system also includes the tutorial support described above. In essence, what Nipper classifies as second generation distance education was defined by Peters (1967) as industrialised distance education.

Nipper applies the term 'third generation' to the emergent system as practised in the environment of the interactive technologies and in particular computer mediated communication (CMC) systems.

It must be noted though that Nipper bases his classification of distance education systems on his assessment of the capability of the media associated with each to support his notion of learning as a social activity. Consequently, the first two generations are seen as being inadequate and it is the third generation system that he strongly advocates. His basic argument against the first and second generation systems is that, in those systems, "learning is not seen to be a social process ... and therefore does not imply interaction with or between learners and teachers". He claims that "learning is turned into an individual instead of a social process" (p.64). His essential thesis is that "learning - although a very *personal* matter - must never be an individual matter - one learns best by and with others" (p.66).

Nipper's rating of the three generations, with its accompanying rationale, has played a major role in encouraging the shift towards an emphasis on social interaction in distance education.

From fordism to post-fordism

While Nipper uses media to inform his classification, other theorists examine the practice of distance education from the perspective of production-line systems.

In making his case for a shift to post-fordism, Raggatt (1993) details the key

attributes of the fordist model which, at a fundamental level, are similar to those which feature in Peters' definition of the industrialised mode. Raggatt, whose area of practice is professional education, is of the view that the prevailing fordist model, with its focus on the centralised production and distribution of a standardised product, is ill-equipped to meet the diverse demands of professional/continuing education at a distance. Consequently, based on his experience in the UK Open University School of Education, he advocates a shift to a post-fordist model since, in his view, this latter model is better capable of supporting the varied educational and training needs of a professional community.

Farnes (1993) makes a connection between post-fordism and third generation distance education. He makes the projection that , "We may be able to develop post-fordist third generation distance education which emphasises, a more decentralised, democratic, participatory, open and flexible system with high levels of teacher and student responsibility" (p.17). One may infer from this that Farnes sees the CMC environment (which Nipper strongly favours) as having the potential for reducing the imbalance in teacher-student relationships, given the environment's capability to facilitate high levels of interpersonal interaction.

Thus, based on the perspectives of at least two distance educators, a post-fordist model of distance education is projected as being capable of supporting flexibility in educational provision, 'just-in-time' production systems, higher levels of interpersonal communication and a more democratic and participatory teaching-learning environment.

However there have also been criticisms. Farnes himself, while acknowledging the potential advantages of post-fordism, notes that "it has yet to demonstrate that it can operate on a mass scale" (p.18). Edwards (1991) is even more critical. He contends that, in spite of giving the impression of providing more opportunity, post-fordism masks the view that "in the market place of education and training, it is those with the largest capital in terms of previous experience of learning who are the biggest and most likely buyers" (p.40).

Whatever the advantages and/or limitations, there seems to be a complementary relationship between the shift from fordism to post-fordism and that occurring in the interpretation and application of interaction. Both appear to represent a movement away from a highly structured top-down system to one that functions with greater flexibility and openness.

It would appear, therefore, that social interaction has emerged in distance education simultaneously with other developments with which it shares certain basic features. It can also be argued that its validity has been reinforced by virtue of the mutually complementary relationship which it enjoys with third generation distance education (as described by Nipper) and post-fordism.

Towards a more robust conceptual framework

In spite of this apparent validation, it can be argued that the notion of interaction as a social phenomenon is restrictive and that it does not, on its own, provide an adequate conceptual framework for facilitating the study and practice of teaching and learning at a distance. In this regard it is worth recalling that social interaction as currently projected, exists alongside the broader and older conception of interaction that combines the 'simulated' and the real.

There is therefore a need to re-examine the whole concept and in this re-examination to include a critical review of this broader construct given its historical significance in the development of distance education as a whole.

What is emerging from the foregoing discussion is that the expansion of distance education in the University of the West Indies is being undertaken at a time when significant paradigm shifts are taking place in the field as a whole. In light of this situation, this core concept needs to be re-examined, with a view to building a conceptual framework that is robust enough to support the development of distance education in the university as a whole and in the Faculty of Education in particular.

Distance education in UWI

The University of the West Indies, (UWI), is an independent institution serving fourteen English-speaking countries in the Caribbean. It comprises three campuses in Barbados (Cave Hill), Jamaica (Mona) and Trinidad and Tobago (St. Augustine), as well as a Centre for Hotel and Tourism in the Bahamas. Its total student population numbers approximately 15,000, distributed among the Faculties of Agriculture, Arts and General Studies, Education, Engineering, Law, Medical Sciences, Natural Sciences and Social Sciences¹. There is also a School of Continuing Studies which has primary responsibility for the development and implementation of all non-faculty programmes in continuing education throughout the Caribbean region.

In 1992, UWI agreed to develop distance education as an integral part of its teaching programme. A study commissioned by the Commonwealth of Learning (COL) to investigate the feasibility of this venture, supported the idea and set out a series of proposals for transforming the university from a single-mode to a dual-mode institution (as it was then conceived). One major proposal was that the distance education offerings should be based on pre-packaged self-instructional materials and that existing academic staff from the various faculties should, with appropriate support, have the primary responsibility for the design and development of these materials (Renwick, Shale and Rao, 1992).

Although the 1992 decision signalled a development that was substantially new, UWI had already had experience with a limited distance teaching project through audio-conferencing. This facility, known as the University of the West Indies Distance Teaching Enterprise (UWIDITE)² was established in 1983, with headquarters on the

¹Over the period of the life of this study, some faculties have merged. The former separate Faculties of Arts and Education have since become the Faculty of Humanities and Education. The name of the former Faculty of Education has been retained in this study, since the major part of the study was conducted when that Faculty existed.

²UWIDITE has since been incorporated into the new University of the West Indies Distance Education Centre (UWIDEC) and that name is no longer used. However, for reasons already stated, it is being used in this study.

Mona (Jamaica) campus. It has been used to deliver a limited number of first year courses in Social Sciences and Law to students in non-campus countries. However its main operation has been the delivery of professional development programmes at the undergraduate certificate level. The Faculties of Education and Social Sciences have been the providers of these programmes, with the Faculty of Education offering the Certificate of Education in five specialisations to primary school teachers in countries throughout the region.

The 1992 proposal signalled a significant change in prior operations both in terms of the scale of the new undertaking and, more importantly, in terms of the primary mode of delivery. As a follow-up to its recommendation regarding the role of the academic staff, the COL Report advised that print-based learning materials should be "the main carrier of distance education programmes" (Renwick et al., 1992, p.39), thus indicating a clear shift away from the prevailing UWIDITE mode of operation. However, it also recommended the continued use of the audio-conferencing facility, both for tutorial purposes as well as to facilitate communication among staff involved in the development and management of the programme.

In a subsequent policy document, the university, through the University Academic Committee (UAC) committed itself to offering distance education programmes at the level of existing certificate, first degree and higher degree programmes, along with access courses. The document also stated that the institution will "seek to provide multi-media courses, using whatever media are appropriate to the subject matter and the circumstances of the students, and feasible within budgetary constraints" (University of the West Indies, UAC Paper: P.38A, 1993/94, p.2). Two factors are to be noted about this document. First, it endorses the COL Report proposal for a shift away from an audio-conference-centred structure. Secondly, it expands on the initial focus on print-based materials, referring instead to multi-media courses.

Other documents provide additional information about the university's position. For example, in *A University Policy for Distance Education*, the newly appointed Board for Distance Education (BDE) established the context of the proposed

development. It stated in part that "conventional and distance education are to be integrated with the closest links between the two" (University of the West Indies, BDE Paper: P.4, 1993/94). What is significant about this statement is that it suggests a likely policy shift from dual-mode to mixed-mode operations, in recognition of a need to integrate the two teaching modes.

The BDE document also presented an outline of the target groups to be served by distance education. It distinguished between students in non-campus countries, those in the three campus countries but studying off-campus, and on-campus students who choose to follow a distance education course. It also distinguished among prospective students in terms of age and educational background, contrasting the younger school-leavers who have not gained admission to one of the three campuses, with more mature students in mid-career. The third distinction focused on programme choice, particularly between students wanting to pursue a degree programme and those seeking continuing professional education.

To the extent that there is a link between the original UWIDITE operation and the proposed development, it would be in that aspect of the university's ongoing commitment to provide professional education. This BDE document and its predecessor, the UAC paper, both make mention of the university's decision to include such programmes as part of its proposed distance education offering.

The demand for teacher education programmes

Governments and other agencies in the Caribbean are placing a lot of emphasis on professional development as they make projections for the growth and development of the education system in the respective countries into the twenty first century. In this regard, regional governments are targeting the university to be a key provider of the necessary programmes.

In Trinidad and Tobago, for example, the Ministry of Education's White Paper on Education (Government of Trinidad and Tobago - Ministry of Education, 1994) forecasts the human resource requirements of the country's education system for the

ten-year period 1993-2003. Within the broad framework of "sustainable human resources development" (p.vii), the Ministry describes its expectations of teacher education and development in this way:

To achieve the objectives set out for the [education] delivery system, institutional managers, educational administrators, teacher educators, teachers and caregivers must be professionally prepared for their respective tasks. Our system of teacher training and education must therefore be of the highest quality. (p.78)

The Paper then emphasises, among other things, the need for continuous training of primary and secondary school teachers through specified programmes either already existing (through face-to-face teaching) or to be developed in the Faculty of Education at the St. Augustine (Trinidad and Tobago) campus. The programmes listed are the Certificate in Education, the Bachelor of Education, both required in a series of special areas, and a B.A./B.Sc. degree linked with a Diploma of Education. The last mentioned is described as "a four year conjoint degree through which persons who wish to teach should attain their initial teacher training" (p.79). (A one year in-service, face-to-face Diploma of Education programme for secondary school teachers currently exists). In addition, the Paper calls for the development of a Certificate programme and a Bachelor's degree in the teaching of technical/vocational studies. It also notes that adult education should be included as an area of specialisation in the Faculty's offerings. What is evident from all of the above is that demands are being made on the Faculty at the St. Augustine campus to service a wide range of professional development needs and to do so with the highest possible level of quality.

The picture emerging from other Caribbean countries is just as demanding as that described above for Trinidad and Tobago. One aspect of this picture relates to the education of primary school teachers. In countries of the Eastern Caribbean, the programme for these teachers has been developed by the Faculty at the Cave Hill (Barbados) campus in collaboration with the Teachers' Colleges of the countries themselves. Almost all the countries have identified areas for improvement in the implementation of the programme (Steward and Thomas, 1996). For example,

Dominica emphasises the need for its teachers to develop competence in multi-grade teaching, a recognised requirement where pupils of different ages and at different grade levels must be taught in a single group. This situation has developed in Dominica because of a declining rural population due to emigration or rural-urban drift. Indeed this problem has been identified as a Caribbean-wide phenomenon (Steward and Thomas, 1996, pp.127-132).

Both Dominica and Grenada highlight weaknesses in their primary teachers' knowledge of the content of the subjects they are required to teach. They claim that student teachers are graduating from Teachers' Colleges with gaps in their understanding of the primary school curriculum. Both countries link this problem to student-teachers' low entry level into the programme and the fact that the programme is itself not equipped to handle the situation. Of interest is the fact that Dominica has taken the initiative to address this problem with the assistance of an agency external to the Caribbean. Modules produced by the Canadian Organisation for Overseas Development are being used to prepare teachers for the Caribbean Examinations Council (CXC) General Proficiency examinations in four core subjects prior to their entry into Teachers' College.

There is also a strong demand for specialist programmes, in particular Early Childhood Education and the teaching of technical/vocational studies. The above issues are all related to the operations of the Faculty of Education at the Cave Hill (Barbados) campus.

When the demands being made of the Cave Hill campus are combined with those discussed earlier in relation to the St. Augustine campus, and others, not mentioned here, regarding the Mona campus, it is evident that the Faculty as a whole is being required to offer a diverse range of educational and training programmes. There are demands for in-service, pre-service and general upgrading programmes, for courses to address specific need areas (for example, multi-grade teaching), for new programmes (for example, Early Childhood Education). Further, in terms of its clientele, the Faculty is expected to offer services to individual students as well as maintain collaborative

working relationships with other tertiary institutions.

What is evident is that within the framework of the university's distance education programme, the Faculty would need to establish structures that are flexible enough to meet these varied demands and, at the same time, to establish systems capable of monitoring quality across different types of offerings.

A comparative perspective

The precedent for the provision of teacher education at a distance is already firmly established at an international level and, in particular, in countries of the South (also referred to as developing countries). In many instances, the distance mode has been adopted in response to urgent demands to provide initial training or upgrading to very large numbers of practising teachers dispersed over a wide geographical area. The system of delivery used in these circumstances can be described as conforming to the fordist (industrialised) model, offering a limited product range to a mass population.

The Zimbabwe Integrated Teacher Education Course (ZINTEC) is an example of this type of provision. ZINTEC was established to redress the imbalance between trained and untrained teachers in the Zimbabwe education system. Chivore (1993) notes that in the period 1980-1988 the number of trained teachers had risen from 20,424 to 29,589. In the same period, the number of untrained teachers had increased from 8,031 to 28,173. It is in this context that ZINTEC was established to provide in-service training for primary school teachers through a structure consisting mainly of a National Centre, colleges and regional centres (these two now combined) as well as the schools in which the student teachers were deployed.

The situation in Nigeria is somewhat more varied even though the industrialised mode still appears to predominate. Aderinoye (1995) lists six institutions providing teacher education at a distance, almost all of which are engaged in delivering a single programme. For example, in 1974, the University of Lagos established a special unit to train science teachers. At its inception it had enrolled 300 students and by the early 1990s, it had trained more than 8000 teachers. The National Teachers' Institute (NTI),

which began operations in 1976 and which Adeniroye describes as "the most dedicated distance learning institution", had, by 1982, produced 300,000 Grade II teachers. In 1988, the NTI embarked on a programme of upgrading Grade II teachers to the level of the Nigerian Certificate of Education (NCE). At its December 1994 graduation, some 21,000 students graduated with the NCE.

Koul and Menon (1992) describe a system operating in India in which sixteen universities offer a B.Ed. degree through distance education, targeted to untrained secondary and higher secondary teachers. For the 1990-91 period, enrolment numbers ranged from 223 in one university to over 21,000 in another. The authors emphasise the importance of maintaining the programmes, given the continuing large numbers of untrained teachers in the secondary sector. Based on the descriptions of the respective writers, the distance education structures cited above are providing a limited product range to a broad student population.

While the overall target population of UWI's Faculty of Education will be much smaller than that of the countries cited above, the range of programmes that the faculty must provide will be wider than that identified for any of these three countries. The Faculty must therefore put in place a structure for distance education which is capable of catering to the needs of specific target groups. What is also required is a concept of interaction that is sufficiently robust to facilitate the examination of teaching and learning and, by extension, provide a framework for monitoring quality across a wide range of programmes.

Aims of the study

In the light of the foregoing, this study was undertaken to attain the following aims:

1. Examine prevailing notions of interaction in order to arrive at a more holistic concept.

2. Using this revised concept, analyse the processes of interaction in selected teacher education programmes currently being offered in the University of the West Indies.

Structure of the thesis

The succeeding eleven chapters are geared towards achieving the aims set out above. Chapter Two discusses social interaction in greater detail and draws attention to the factors that limit its capability to support, on its own, the study of teaching and learning at a distance. The chapter ends with the position that, given the limitations noted, there is need to revisit the older conception in order to move towards a more holistic concept of interaction.

Chapter Three explores the industrialised second generation notion of interaction and as an extension, re-appraises Moore's concept of transactional distance. It then examines Bates' two contexts of interaction and Moore's three types, which are collectively regarded as attempts by the respective authors to counteract the exclusive focus on social interaction and to re-orient thinking towards broader conceptions. In my view both treatments reflect the influence of the second generation approach hence their inclusion in this chapter. The chapter ends by pointing out limitations in both treatments and proposes two alternative types, namely learner-media interaction and learner-knowledge interaction, to add to the already existing social interaction.

Chapter Four draws on literature from both within and outside of distance education to build a construct entitled learner-media interaction. To this end it examines three sets of literature dealing with the relationship between media and learning. Chapter Five focuses on learner-knowledge interaction. It also explores the concept of knowledge itself, as well as issues regarding power and control, all in relation to the overall concept.

Chapter Six pulls all of the foregoing together and proposes the concept of interaction as a three-part holistic, integrated construct. This revised concept is also proposed as the theoretical framework for the research programme. The chapter then

identifies the two sub-studies' that make up the research programme, namely an exploratory survey, developed out of key attributes of the social interaction component of the holistic concept, and an observation study that was designed within the framework of the learner-knowledge component. Both sub-studies were located in teacher education programmes of the Faculty of Education of the University of the West Indies. The chapter ends by outlining the research questions and objectives for each study.

Chapter Seven outlines the methodology for each of the two sub-studies. As part of the methodology for the observation study, it describes the approach taken for constructing an interpretive framework that was used as the basis for analysing the data of that study. Chapter Seven also describes selected aspects of discourse analysis that were utilised for data analysis in the observation study.

Chapter Eight presents the findings of the exploratory survey. Chapter Nine describes in detail the setting up of the category system that constituted the interpretive framework referred to above. As part of that exercise, the chapter identifies and summarises key issues emerging from the data, then proposes two subsidiary research questions to guide further, more detailed, analysis of the data of the observation study.

Both Chapters Ten and Eleven are devoted to the analysis of data from the observation study. Chapter Twelve evaluates the contributions of both sub-studies, namely the survey and the observation study, draws conclusions and makes recommendations for further work.

¹For the purpose of clarity, the term 'sub-study' is sometimes used to refer to the two pieces of empirical research conducted, in particular in instances when they may be confused with the overall work, which is itself identified as the study. Notwithstanding the above, the main piece of research work is always identified by the commonly used term, 'observation study'

CHAPTER 2

INTERACTION AS A SOCIAL PHENOMENON

Introduction

In light of the current focus on interaction as a social phenomenon, this chapter examines this notion with a view to assessing its capability to support the study and practice of teaching and learning at a distance. In the literature, much emphasis has been placed on prescribing and analysing conditions for facilitating communication between teachers and learners when both occupy equitable positions in their relationship. Thus, at an overall level, the chapter explores issues related to effective communication in a distance learning environment that seeks to foster collaborative rather than top-down relationships between teachers and learners.

In addition, there have emerged more specific concepts which, while retaining their respective identities, can be regarded as being manifestations of the broader notion of social interaction. Collaborative learning, and dialogue are examined in this light.

Finally, the chapter draws attention to the issue of learner autonomy which certain advocates of social interaction highlight as a key area of concern, given the overall goal of reducing the imbalance in teacher-learner relationships and thereby increasing symmetry.

A definition

Cookson and Chang (1995), in their analysis of teaching and learning by audio-conferencing (to be discussed later) make a distinction between social interaction and instructional interaction. Social interaction, they state, refers to the interpersonal communication that takes place between individuals in social settings. They apply this definition both to face-to-face communication and to communication mediated by the interactive technologies. Of interest in their definition is the link that they make between communication and the setting within which the communication takes place.

Wagner (1994) also highlights the setting of the communication. She uses the term 'social interaction' synonymously with 'interpersonal communication' and describes the former as the mutual modification of behaviour by individuals responding each to the other in social settings. Wagner's extended definition is also pertinent. She states that "interactions are reciprocal events that require at least two objects and two actions" and that "interactions occur when these two objects and events mutually influence one another"(p.8). She explains further that these reciprocal actions may be "verbal and non-verbal, conscious and non-conscious, enduring and casual" (p.6). What Wagner brings to the definition is a recognition that human beings effect changes in the behaviour of one another as they engage in the act of communication. Her inclusion of both verbal and non-verbal communicative acts in her concept of interaction is also very appropriate.

The definition of social interaction that is used to initiate the discussion in this chapter draws on the two outlined above. Specifically, it recognises that all social interaction involves communication (both verbal and non-verbal) between and among human beings, that in the process of communicating, behaviour change occurs and that this communication takes place in some social context.

Studying the communication

As noted earlier, a key attribute of interaction as a social phenomenon in distance education, is its de-emphasising of the teacher in a didactic role and a corresponding heightening of focus on the learner in an active, initiating role in the learning process. What is envisaged is a relationship in which the responsibility for guiding the learning process is shared more equitably between teacher and learner than is the case in conventional formal education whether at a distance or face-to-face.

Current thinking holds that the maintenance of this more symmetrical relationship presupposes direct person-to-person contact between teachers and learners as well as among the learners themselves and that it rests to a significant degree on the nature of the communication among the participants. To this end, attention has been

paid to examining factors in the participants as well as in the social setting that enhance and/or hinder effective communication.

Relevant factors

Fulford and Zhang (1993) report on a study that they conducted among teachers pursuing an in-service course on science and health education to investigate learners' perception of interaction both at the personal level and at the overall group level. The study was also aimed at determining whether perceived levels of interaction can serve as a predictor of learner satisfaction with instruction. The course itself was delivered through a four-channel interactive closed-circuit television network. Based on their findings the researchers conclude, in part, that as perception of interaction at the group level increases, perception of personal interaction increases. This, they claim, suggests that there is a dynamic relationship between what learners perceive is happening personally and what is occurring for the class as a whole. They also state that "perception of personal interaction seems to be only a moderate predictor of satisfaction" (p.17).

A complementary study was conducted by May (1993) to investigate women's perceptions of the role of collaboration in their experience as distance learners. May based her study on the premise that collaboration is a fundamental principle in the process and content of feminist education and she says of collaborative learning that it "involves a sharing of power, responsibility and experience, and a valuing of active participation and egalitarian principles" (p.40). May conducted in-depth interviews with nine women who had pursued feminist courses either through home study, which included once-a-week access to a telephone tutor; or audio-conferencing, which involved the use of the same course materials provided to the home study group but also involved six or seven bi-weekly audio-conferencing sessions, supplemented by individual telephone access to tutors.

Drawing on the interviews, May notes that some of the comments revealed a significant level of discomfort with, and even resistance to student interaction. One

interviewee felt that it might reduce her self-confidence as a learner, another felt it could hamper progress. There were also objections on the grounds of time and domestic commitments. May concludes, in part, that "distance educators need to re-evaluate what collaboration in learning can mean in distance education" and that "increased learner interaction is not an inherently or self-evidently positive educational goal or strategy" (p.47).

Gunawardena and Boverie (1995) seek to analyse the relationship between learner characteristics and group functioning. These researchers located their study among distance students pursuing a postgraduate degree in Training and Learning Technologies, through audiographics and e-mail. While the programme was conducted at a distance for all students, some of the students were based at a site on a campus while others were at another site about 100 miles away from the campus.

Three instruments were developed for use in this study. Learner characteristics were assessed using a demographic instrument as well as the revised Kolb Learning Style Inventory (LSI). The demographic instrument sought information on age, gender, ethnicity, educational experience and number of years away from formal education. The LSI was used to classify students according to four dominant learning styles namely accommodator, diverger, assimilator and converger. The third instrument, a questionnaire, was used to examine variables related to group functioning. The variables examined through the questionnaire included satisfaction with the group, group communication, decision-making, goal setting and leadership. Data were collected on all three instruments and analyses of variance (ANOVA) were used to examine the interaction of learner characteristics and group functioning.

Based on their analyses of the data from all the students taken collectively, the researchers report no significant difference in the interaction of any of the demographic variables and the group functioning variables. Neither was there any significant difference in the interaction of the respective learning styles and the same group variables. In essence therefore the research did not generate any noted findings in relation to the original objectives set.

Nonetheless, the researchers were able to make other observations about the sample surveyed. For example, when the two groups of students were observed separately, there was a significant difference between on-campus and off-campus students in goal-setting, one of the group variables, with on-campus students displaying greater satisfaction with this activity than off-campus students.

Gunawardena and Boverie conclude that learning environment (i.e. location of learning) was a greater indicator of students' reaction to group functioning than was learner characteristics. In other words, the fact that some students were on-campus and others off-campus provided more information about their behaviour in a group than did the fact that they were characterised as accommodators, divergers, assimilators or convergers. On the whole the researchers admit that limitations in the study itself may have contributed to the absence of any clear finding on the primary objective of the study, namely the interaction of learner characteristics and group functioning.

Summary discussion

To varying degrees, each of the three studies deals with the attributes and competencies required in both the individual participants as well as in the social environment that are necessary for facilitating the best possible communication in an interaction which, as far as possible, is not based on a top-down relationship between teacher and learner. It is worth noting though that nothing in any of the discussions addresses the issue of learning as a cognitive activity geared towards the building of new knowledge. Consequently it would appear that, based on the works cited above, social interaction, on its own, does not provide an adequate context for examining all facets of the teaching-learning process.

At the same time, whether or not one subscribes to the imperative of high levels of direct person-to-person contact between distance teachers and learners, one cannot avoid dealing with the issues raised above. For example, are distance students really disadvantaged when they are required to collaborate as May's study seems to suggest? In addition, while the findings of Gunawardena and Boverie's study were largely

inconclusive, the initial concerns of the researchers still warrant consideration, namely, is there an interaction between the personal characteristics of the individual learner and how learners function in a group setting?

An examination of these issues, which pertain to the social environment in which cognitive activity takes place, can be expected to make an important contribution to an understanding of social cognition.

Collaborative Learning

The issues addressed above are given more focused attention in the discussions on collaborative learning. Underpinning this concept is a view of learning as a community activity. It is important to note though that while the concept itself has been applied in various educational settings, within recent times the main discussions about it have been conducted within the framework of computer mediated communication (CMC). This intrinsic link between the study of the concept and the technological environment within which it is being studied, has meant that discussions about it have often been submerged within comments about the contribution of the environment to collaboration.

The position taken here is that, in the interest of conceptual clarity, there is need to make a distinction between the two sets of issues. Consequently, for the purpose of this discussion, collaborative learning is being examined independently of its relationship with the CMC environment. Its key attributes are discussed below.

The role of the group

All proponents agree that the core attribute of collaborative learning is its focus on the group as the most appropriate setting for learning. Mason (1994) suggests that this approach to learning has its origins in business and industry which emphasise a team approach to training. Kaye's (1992) explanation can be regarded as providing the key features of the group activity. He explains, "Successful collaboration assumes some agreement on common goals and values and the pooling of individual

competencies for the benefit of the group or community as a whole" (p.2). Also of interest is Kaye's perspective on the interchangeability of roles, where different members of the group or community may assume different roles as required at different stages in a collaboration. Thus, according to Kaye, there are no fixed, pre-determined teacher and student roles.

Based on her practice, Harasim (1989) proposes three group types for collaborative learning. These are co-learning dyads, involving two learners in a one-to-one relationship; group learning, involving a small number of learners in a many-to-many relationship with the teacher outside of the group; and the seminar, another many-to-many arrangement with the teacher acting as guide within the group. Advocates of collaborative learning regard both one-to-one and many-to-many working relationships as being equally important in the learning environment.

Davie (1989) also draws on her practice to address the issue of groups. She describes group task roles and group building and maintenance roles, and emphasises the importance of the tutor being skilled in performing both sets of roles. Some of the group task roles that she lists are initiator, information seeker and giver, opinion seeker and giver, elaborator and co-ordinator. Examples of group maintenance roles listed are harmoniser, compromiser, observer.

Davie also identifies specific strategies for implementation within the group. For example, she describes strategies for facilitating joint writing projects. She also recommends the use of subgroups (which she refers to as electronic learning partnerships), and work spaces or subconferences to allow students to submit "their arguments for comment and critique" based on some specific assignment (p.83). Davie emphasises that the strategies proposed are applicable "to any course designed to support student-to-student interaction, rather than the one-way flow of interaction from instructor to student" (p.85). In a real sense, Davie's tutor acts as a facilitator whose role in the group is to encourage the learner to function in a more initiating capacity.

Overall, the group is seen as the forum for realising the ideal of symmetrical relationships and for facilitating learner initiative in the teaching-learning context.

Active/interactive learning

Another attribute of collaborative learning is its emphasis on active learning. Harasim defines active learning in terms of the level and amount of individual participation. In the context of CMC, the number of messages written by the respective participants is the unit used to measure participation. However, it is interactive learning that Harasim emphasises. She favours conferencing exchanges in that they are "student-centred, involving dynamic and extensive sharing of information, ideas and opinions among learners" (p.55). Mason also focuses on interactive learning, drawing attention to specific learning activities that demonstrate the capability of computer conferencing to support collaboration. In this regard, she highlights discussion, brainstorming, role playing and joint presentations as examples of interactive learning activities that can be realised in a collaborative environment.

The concept of interactive learning is more specifically referred to by some proponents as the co-construction of knowledge. Gunawardena (1991), citing Harasim, is of the view that learning in a group enhances the ability of the individual to generate, link and synthesise ideas, and build knowledge. Kaye (1992) cites several sources to support certain assumptions regarding the benefits of learning in a collaborative environment. For example, he contends that deep-level understanding is facilitated through conversation, argument and debate, and that learning is essentially a communal activity involving the social construction of knowledge. He also claims that "peer collaboration in learning can directly help to develop problem-solving skills and strategies through the internalisation of the cognitive processes implicit in interaction and communication" (p.3).

By focusing on the co-construction of knowledge, advocates are making claims for the capability of collaborative learning to support certain types of cognitive activity. In this regard collaborative learning represents an advance on the broader treatment of social interaction. Fulford and Zhang, and May, for example, make no attempt to address matters related to learning as the acquisition of knowledge.

Linking the social and the cognitive

Collaborative learning is clearly projected as a concept that portrays the social setting in which learning takes place as being intrinsically bound to the act of learning itself. There is an almost taken-for-granted assumption that a collaborative learning environment is inherently capable of facilitating the types of learning identified.

However there is little in the relevant articles to substantiate these claims. This is not to say that the social conditions that are consistent with this environment may not be those best suited for the implementation of the learning activities identified. For example, brainstorming certainly needs to be undertaken in conditions that foster optimum equity among participants, and it is likely that conversation, argument and debate have the potential for facilitating deep-level understanding. However it can be said that, by focusing exclusively on environmental factors, the proponents of collaborative learning are underestimating the complexity of the learning process and the multi-faceted nature of the conditions required for learning to take place. This will be explored more fully later.

The social and the cognitive in practice

The gaps between the alleged capability of the social environment and actual learning are also evident in a description of practice. Some observations that Rowntree (1995) makes about his experience as a tutor in a collaborative learning exercise in a computer-conferencing environment are pertinent in this regard.

Rowntree makes the point that what students in this environment learn "is not so much product (e.g. information) as process - in particular the creative process of offering up ideas, having them criticised or expanded on, and getting the chance to re-shape them (or abandon them) in the light of peer discussion" (p.207). This apparently straightforward proposition that Rowntree makes about the type of learning that computer-conferencing supports, masks some important issues that deserve closer examination. For example, if it is indeed the case that the environment is more suited to the learning of process skills rather than content (product), what are the implications of

this apparent shift for the design of learning experiences? Further, what are the precise attributes of the environment that facilitate one type of learning above the other?

There is also the question of the relationship between and among knowledge from different sources. Rowntree draws attention to two sources of knowledge that are present in the on-line course and which he refers to respectively as 'learners' public responses' and 'the concepts at issue in the course'. With regard to the former he contends,

Even where the on-line course relates to set readings or other learning materials, the learners' public responses to those materials are also part of the **content** of the course. They form part of the body of knowledge that is to be addressed.
(p.208)

Later, in describing the role of the tutor he says, "And of course, the on-line tutor is still concerned with teaching - with ensuring that participants extend and deepen their understanding of the concepts at issue in the course, and their competence in applying them" (p.210).

Rowntree does not specify what exactly constitutes 'learners' public responses'. One may assume though that they could include knowledge generated out of the learners' engagement with the official course content as well as the practical, experiential knowledge that learners could have brought into the current teaching-learning situation. The inclusion of knowledge from learners' experience in a formal education setting, is potentially problematic. For, it is often the case that the knowledge that the learner brings to the teaching-learning situation, is not accorded the same status as the knowledge that the teacher transmits. Specifically, the practical, experiential knowledge of the student is not often considered in the same light as the official course content. Rowntree does not give any indication of any attempt within the collaborative learning environment to address any possible tensions that may arise between knowledge from these two sources. Such an examination is particularly pertinent if, as Rowntree claims, there is an intention that learners' public responses and the official

course content will ultimately combine as "the body of knowledge that is to be addressed".

Learning: individual or collective activity?

In spite of his own strong advocacy of the tenets of collaborative learning, Kaye, cited earlier, is aware of the need to address the tension between learning as an individual activity and as a collective undertaking. He seeks to clarify the issue with the statement that "learning is inherently an individual, not a collective process, which is influenced by a variety of external factors, including group and interpersonal interactions". Given the fact that interactions require the use of language (a social process) in the re-organisation and modifications of the individual's knowledge structures, he asserts that "learning is simultaneously a private and a social phenomenon". Consequently he defines collaborative learning as "the acquisition by individuals of knowledge, skills or attitudes occurring as the result of group interaction" (1992,p.4).

Kaye's recognition of an individual dimension in the learning function stands in sharp contrast to Nipper's proposition that learning is a social process. It must be noted though that, at a definitional level, Kaye's ultimate position is that learning is both private and social. However when one examines his overall treatment of the concept there does not appear to be any marked difference between his position and Nipper's. Essentially, for both theorists, learning is to be treated as a communal activity.

Power and control

Another issue which has attracted the attention of some advocates pertains to the problems that are likely to arise when implementing collaborative learning in conventional educational settings. Both Kaye and Mason draw attention to the negative effects of the one-way transmission mode of communication in traditional education. They observe that this mode can engender authoritativeness in the teaching role and passivity in learner behaviour and attitudes. Consequently they emphasise that attempts

to implement collaborative learning in such environments may be fraught with difficulties.

The rigid top-down communicative environment of traditional education imposes constraints on the nature and quality of learning experiences. However the pattern of communication within institution-based education cannot be treated simply as a legacy of bad practice. While not ignoring or condoning bad practice, it is important to recognise that communication patterns in any institution are grounded in the power relations that underpin the functioning of the institution.

The relationship between and among individuals in an institutional setting is influenced by the positions which they occupy in that setting, and to a significant extent, those positions are determined by the pattern of power relations inherent in the structure and function of the institution. Thus, if a fundamental objective of collaborative learning is to influence and/or alter the patterns of communication in teaching-learning settings, it must of necessity seek to examine the issue of power relations as an integral aspect of the communicative process.

Summary discussion

Collaborative learning emphasises the benefits to be derived from the sharing environment of the group. It therefore proposes clear strategies regarding group formation and group roles. It strongly favours greater equity in teacher-learner relationships, with learners assuming more initiating roles in their own learning. It also advocates that teachers should function more as facilitators and less in a didactic capacity.

With regard to the act of learning, proponents of collaborative learning point to its value in supporting learners in the co-construction of knowledge. In this context they identify learning skills (problem-solving) and learning events (role play) that the environment facilitates. Overall they hold the view that while learning may be an individual activity, people learn best in groups.

Based on the literature reviewed, it would appear that the intrinsic link which is made between the setting in which learning takes place and the learning itself is not adequately substantiated. Their position seems to be that one can influence cognitive behaviour by manipulating the external environment in specified ways. This focus on the external is reminiscent of behaviourism and provides an inadequate framework for making statements about learners' internal cognitive processes.

While recognising its contribution to issues related to the management of the communication in a teaching-learning setting, the concept is still deficient in its lack of attention to the issue of power relations in interpersonal communication, particularly when the communication is taking place in an institutional setting. It seems feasible that any concept that is intended to be used to influence patterns of communication in a teaching-learning context, should also be sensitive to the effects of power relations in that situation.

In spite of all of the above, collaborative learning represents an ideal that can serve as a reference point against which to assess practices and attitudes in a conventional setting. Specifically, its principles can be appropriate for examining patterns of behaviour in a professional education setting whose overall aim must necessarily be the development of capable and confident professionals. In addition, the claims made about the function of groups in learning warrants examination in as wide a range of real life settings as possible.

Dialogue

There are three factors regarding the discussion of dialogue in this chapter that should be noted.

First, like collaborative learning, the term *dialogue* has been used to define the relationship between teaching and learning in educational contexts other than distance education (e.g. Freire, 1972). However, as was the case with collaborative learning, the discussion of the concept in this work is restricted to its application in a distance education context.

Secondly, even within distance education, its development and application has been restricted even further to the work of a group of theorists and practitioners in a single country, Australia, with most of them operating within a single institution, Deakin University. However this group of distance educators have made it possible, through their writings, for other theorists and practitioners to engage with their ideas. In fact the concept as developed and used by this group has been co-opted and given extensive coverage in the work of other theorists (e.g. Lockwood, 1992; Morgan, 1993). In light of the foregoing, *dialogue* as developed in distance education, is considered significant enough to warrant examination in this discussion on interaction.

Thirdly, some of the policies and practices associated with it do not necessarily involve person-to-person contact between teacher and student, or student and student. One recalls that a key factor informing the current emphasis on social interaction is the concern that distance teachers and learners should have high levels of direct contact with one another. As noted earlier this orientation was influenced to a large extent by the availability of communication technologies that make this contact possible.

In contrast, 'dialogue' was not developed in the context of these technologies. Rather, it was introduced as an innovation to effect change within the industrialised mode of distance education. In that context, it applies equally to interaction among people and a simulated interaction through course materials. Nonetheless, it has been included under the umbrella of social interaction since its core thesis, built around terms such as 'exchange of meanings', 'community' and 'personhood', serve to project a strong awareness of the human factor, and a commitment to building meaningful human relationships in the practice of teaching and learning at a distance. At the same time though, its inclusion necessitates an extension of the original definition of social interaction and this will be addressed later.

A definition

Dialogue was introduced into the industrialised mode of distance education in order to effect a radical departure from what some of its proponents refer to as 'instructional industrialism'.

Evans and Nation (1989) two key advocates of dialogue in the distance education context, use the phrase 'instructional industrialism' to refer to practices in the field which, in their view, run the risk of alienating students from teachers and from wider educational and social processes. They are particularly opposed to the instructional package which they regard as a key agent in fostering asymmetrical student-teacher relationships. Evans (1989) refers scathingly to "some brilliantly articulated and beautifully illustrated course texts, [which] can leave the student with a feeling of inadequacy in the face of such perfection, or uncritical contentment with having been 'enlightened'" (p.117). Other theorists in the wider field of open and distance learning hold similar views. For example, Snell, Hodgson and Mann (1987), in making a case for a movement "beyond distance towards open learning", contend that "the former approach tends to reflect a hierarchical image of society in which authority and power reside with those who are the holders and regulators of expert knowledge" (p.169). Rumble (1989) expresses his own dissatisfaction with "mass produced courses with an 'authoritarian' flavour" (p.248).

In contrast to the perspectives outlined above, there are others in the field who may argue that these negative comments are unjustified, since distance materials must be designed according to clearly defined standards if they are to meet the needs of students who are separated from their teachers. Evans and Nation and their colleagues at Deakin University do not share this view, and, as an alternative, they propose this concept of dialogue. One member of the team (Modra, 1991), acknowledges the influence of Freire in their use of the term. In introducing his notion of dialogue into the theory and practice of adult education, Freire himself asserts in part,

Dialogue ... requires an intense faith in man, faith in his power to make and remake, to create and re-create, faith in his vocation to be more fully human ... Faith in man is an a priori requirement for dialogue ... His faith, however, is not naive. The 'dialogical' man is critical and knows that although it is within the power of man to create and transform, in a concrete situation of alienation, men may be impaired in the use of that power. (Freire, 1972. p.63)

Evans and Nation (1989), two key advocates of dialogue in the distance education context, provide the following definition of their use of the term. They state,

Dialogue involves the idea that humans in communication are engaged actively in the making and exchange of meanings, it is not merely about the transmission of messages. (p.37)

Extending on this basic definition, they state further,

We are advocating a philosophy which recognises student autonomy and strives for dialogue. It is most important that students are understood as the key agents in their own learning and that both individually and collectively they can ... shape their own learning. (p.39)

Based on this definition, dialogue can be said to incorporate three core tenets:

1. It is concerned about maintaining meaningful interaction among participants in the teaching-learning exchange;
2. It aims at recognising the value of all participants in the exchange;
3. It seeks to build an environment in which students are able to assume responsibility for their learning.

Dialogue in practice

This fundamental philosophical position is reflected in a range of perspectives that the proponents hold about the practice of distance education. For example, they emphasise the importance of humanising the distance teaching-learning environment. In

this regard they insist that they, as course developers, are the persons best suited to administer the courses they develop. Kemmis (in Modra, 1991) makes the point that the practice of developing a course then getting it frozen so that it can be administered by other persons, may erode rather than enhance dialogue. He claims that, as a matter of principle, he and his fellow course developers "would teach the courses they developed rather than hand them over to other people to do the teaching" (p.86).

His views are shared by his co-discussant Modra (in Modra, 1991). She is particularly concerned about the erosion of the human factor in distance education and is disturbed about the 'efficiency-oriented production-line approach' which requires courses to be developed in a manner that would allow "any teacher to engage in the teaching of courses developed by other people" (p.88). These two writers certainly place a high priority on fostering close interpersonal relationships between teachers and distance students.

These notions of 'teacher' and 'teaching' are taken even further by Nation (1991). In his interview with Bruce King, he clearly asserts,

Well, I have this habit ... of thinking very much in terms of the classroom analogy ... if we're going to be distance educators or teachers ... whatever we call ourselves, we need to think of ourselves as having a class, a group of people who may be in a room with us or may be scattered all over the countryside, hither and thither. (p.123)

Nation acknowledges King's doubts about the teaching role he is carving out for himself, but maintains his commitment to it as evidenced when he quips, "I think it's inevitable that good teachers will have students bringing them apples!" (p.125).

There is also the issue of assessment. Evans and Nation (1989) contend that "assessment should be understood as *for the students* rather than for institutional or external selection or grading procedures" (p.39). They contend that students should be allowed to define or negotiate the nature and extent of the work by which they would be assessed.

Specific applications

Alongside the general strategies described above, advocates sought to operationalise the concept in specific aspects of their practice. Fitzclarence and Kemmis (1989) built it into the design of a master's course on Curriculum Theory that they implemented at Deakin University. Drawing on the ideas of innovators in the field of curriculum theory, these distance educators set about to develop approaches to help "teachers and others to articulate and elaborate ideas and issues, based on actual teaching situations". Their aim was to provide an environment that would support teachers as 'extended professionals', conducting their own action research.

They explain that extended professionalism involves three basic functions, namely the commitment to systematic questioning of one's own teaching as a basis for development, the commitment and the skills to study one's own teaching, and the concern to question and test theory in practice by the use of those skills. Against this background, student-teachers would conduct projects to explore their own work and working situations (pp. 151-152).

This approach to the design and implementation of projects is based on the notion of project-based learning which Morgan (1984) defines as an "activity in which students develop an understanding of a topic or issue through some kind of involvement in an actual (or simulated) real-life problem or issue and in which they have some degree of responsibility for designing their own learning activities" (p.2). For these practitioners, *project work* represents a key application of dialogue.

Multi-voice technique

The concept of dialogue was also operationalised in the multi-voice technique that Nation employed in designing the teaching texts for his course on the Sociology of Educating. In developing this technique, Nation acknowledges the influence of the work of Mulkay who sought to create a new form of sociological text that would replace the authoritative monologue with a dialogue between a variety of independent

voices. Nation (1991), uses extracts from his own teaching materials, to demonstrate how he shifts from a voice addressing the students, to one reflecting on his own private thoughts, to another in which he assumes the voice of the student reacting to or commenting on a statement made by him the teacher, and even at times, his own (teacher's) voice responding to the student's remark. The author says of his strategies that they were influenced, in part, by a resolve to create teaching materials driven by 'method' rather than by 'content'.

It is in the design of course materials that the practice of dialogue can be regarded as extending on the definition of social interaction outlined earlier. The interaction being proposed here is not between persons but between the learner and a voice (or voices) embedded in the text. In this regard, Nation's work is continuing and building on the work of earlier theorists, for example Holmberg and Gilliard (to be discussed more fully later) who advocate the use of strategies to make the materials more conversational. Nation himself acknowledges the influence of Gilliard in his approach.

Education community

The most complete expression of dialogue is reflected in the idea of the education community, which in turn is given concrete form in the Course Journal and the Annual Conference built into the course on Curriculum Theory mentioned earlier. Fitzclarence and Kemmis, the course developers, say of the Journal that it "offered the prospect of collaborative exchange in which course team members could enter the forum on a more equal basis with students" (Fitzclarence and Kemmis, 1989, p.152). They describe the annual conference as an event where course team members and students alike would read and discuss papers face to face. They further emphasise that both innovations were central to the pedagogical design of the Curriculum Theory course and that these innovations provided the basis for the building of the education community in which "people can legitimately see themselves as the producers, not just the products of history" (p.167).

The practitioners reflect

Opinions about the operationalising of dialogue are ventilated in the three-way discussion between Fitzclarence and Kemmis, the course developers of the Curriculum Theory Course and Helen Modra (Modra, 1991). Kemmis argues that if the idea of the education community is to be accepted, the individual distance educator needs to do a personal re-assessment of "what it means to teach and what it means to learn". He asserts further that there should be a re-appraisal of the 'receptacle notion' of education which casts the student in a re-active rather than a pro-active mode. He continues his reflection in this way:

The idea of community ... is something we really do need to think about in a slightly more complex way. We think about community in the face-to-face geographical location kind of way ... In that way maybe you can talk about the tutorial group ... as a community, but of course it's not, or if it is, it's in a very attenuated kind of sense ... I think that what we were groping towards, in the notion of community was the idea that somehow there was going to be a negotiation between the students and us where they could be pro-active as well as re-active and we could be re-active as well as pro-active in our connections. (p.90)

However the discussants are very conscious of the difficulties involved in creating this type of community. For example, in relation to the course journal, Kemmis admits.

One of the things we learned out of the course journal failure was that we'd made the conditions of the communications with us, in one sense so open, that it was hard to engage us. We weren't actually giving the students enough 'meat' to enable them to join in the conversation. (p.91)

Ultimately Modra summarises the discussion with the searching question.

How might we more powerfully engage with and theorise a crucial issue that

the recorded conversation only touched upon - the part played by inequalities of power, status etc. among participants in dialogue? (p.99)

Assessment of dialogue in practice

There are three important issues arising out of the various positions taken on the concept of dialogue. The first relates to perspectives on the teacher role and, by extension, the notion of the 'classroom'. Both collaborative learning and dialogue advocate a more symmetrical teacher-learner relationship as well as greater student autonomy. However, while the proponents of collaborative learning seek to attain this by reducing the spotlight on the teacher, advocates of dialogue appear to favour increased focus on the person of the teacher. To a greater or lesser degree, all advocates of dialogue are casting the course developer in the role of the conventional classroom teacher. Indeed, Nation is clear that his geographically-dispersed group of distance students constitute a class in the traditional face-to-face sense of the word.

There are two implications of this arrangement that warrant consideration. In the first instance, there is the question of the size of the 'class'. Since all students doing a single course are expected to be in contact with a very limited number of teachers (and probably only one), it is clear that only a limited number of students can be accommodated, if reasonable student-teacher ratios are to be maintained.

Of even greater significance is the role and status of the teacher. These distance educators clearly state their commitment to creating a climate that would support greater learner autonomy and increased symmetry in teacher-student dialogue. However, in their drive to make themselves, as practising distance educators, more human in the eyes of their students, they are, consciously or unconsciously, also heightening their own personal profiles. The 'classroom' climate which Nation and others want to build, is very much teacher-centred and the overall effect is one of a strong, all-pervading, albeit caring teaching role which is more likely to dominate than facilitate.

The multi-voice technique which Nation in particular advocates, also deserves attention. No doubt Nation, like Mulkay, sees it as a means of minimising the

authoritativeness of the single top-down line of textual communication. In this regard, Thorpe's (1991) reservations about the technique are worth noting. She comments,

The idea of interweaving characters and voices into one text [looks interesting]. But will this not generate even more text and close down opportunities for learners to create their own authorial text? However dialogic the independent voices, the text will still emanate, for the learner, from an authorial source, the institution which registers, assesses and examines them. (p.17)

Thorpe's critique of this innovation is worth noting. In spite of the multiplicity of voices, it is still the teacher who determines how and when the various voices are heard. Thus, in Thorpe's view, the power of the teacher is enhanced rather than minimised. As in the case of the 'classroom' arrangement, the dominance of the teacher role persists.

Thirdly, there is the notion of the education community. It is clear that the advocates see the Journal and the Conference as the prime concrete representations of the concept of dialogue. However as they themselves were soon to find out, the ideal of having course developers and students enter these two fora on an equal basis, would involve a lot more than simply setting up organisational structures and stating the intended goals of those structures. Their admission that "we weren't actually giving the students enough 'meat' to enable them to join in the conversation" and their willingness to pay attention to "the part played by inequalities of power, status etc. among participants in dialogue" (Modra, 1991), strongly suggest weaknesses at the level of conceptualisation. It is evident that at a conceptual level, dialogue, like collaborative learning, does not adequately account for the issue of power and control.

As noted earlier, the concept of dialogue emerged out of a rejection of what was labelled 'instructional industrialism'. Its emergence represented a strong intention to re-orient teacher-learner relationships in distance education and to foster a climate in which there would be the making and exchange of meanings rather than the transmission of messages. However, based on the admission of the proponents themselves, it would

appear that the effects of instructional industrialism had not been eliminated and that it would ultimately emerge to erode the effectiveness of dialogue.

Summary discussion.

Dialogue can be said to embody a commitment to humanising relationships between distance teachers and students. It represents a strong reaction to the impersonal practices of the industrialised mode of distance education and advocates a more participatory, sharing teaching-learning environment that provides scope for learners to engage in 'conversation' with their teachers and to occupy both reactive and proactive roles in these 'conversations'.

When compared with collaborative learning, there are two ways in which the two concepts differ.

First, the concept of dialogue (as developed in distance education) appears to be grounded in a more clearly articulated ideology of teaching and learning than is collaborative learning. For example, the idea of the education community, based as it is on a perspective that both teachers and learners should see themselves as producers and not just products of history, seems to imply that its proponents are not only interested in improving the practical teaching-learning situation, but that they are also aspiring to the ideal of a learning environment that can facilitate the enhancement of the human condition. In this regard, one notes the link which they make with the Freirean concept.

Secondly, while dialogue emphasises the benefits to be derived from meaningful person-to-person contact, it still gives high priority to the 'socialising' and humanising capabilities of course materials as part of the distance education experience. Indeed, the approach to the design of course materials is seen as reflecting an extension of the direct person-to-person conception of social interaction.

Notwithstanding its noted contribution, like collaborative learning, its main weakness lies in its lack of attention to the effect of power relations in the exchange. Modra's comment regarding the inequalities of power and status among participants highlights the need for a concept that can be used to illuminate the roles of the

respective participants as well as the manner in which those roles impact on one another.

It also does not address the cognitive dimension of learning but, unlike collaborative learning, it does not make any claim for doing so.

Of interest though is its ideal that adult distance students should be recognised as "the key agents in their own learning" and that they should occupy both proactive and reactive roles in their communication with their teachers. These qualities are particularly pertinent in the context of a teacher education programme whose primary goal is to develop professionals who must carry the responsibility for their own practice.

Learner autonomy within social interaction

As noted above, a primary objective of the respective representations of social interaction is the enhancing of the role and function of the learner. Learners are projected as being less dependent on a teacher-figure than in a conventional setting, and as assuming greater responsibility for their learning. Some distance educators have recognised that this quality cannot be taken for granted and have sought to examine the factors necessary for facilitating its development within the learner. *Learner control* and *independent interaction* are examined in this regard.

Learner control model

Garrison and Baynton (1987) are among those who pay specific attention to the changing role of the learner. They propose their model of learner control as a means of illuminating learner role within a teacher-learner relationship based on greater equity. They argue against an exclusive focus on learner independence and propose instead the broader concept of *control* which they interpret as "the opportunity and ability to influence, direct and determine decisions related to the educational process" (p.5). They maintain that it is in the process of two-way communication between teacher and student that control can be attained.

Concept definition

They further specify that their notion of control embodies three components namely *independence*, *power* and *support* and they contend that "to be fully in control of the learning process, the student must have the freedom to explore possible learning objectives, the power to handle a learning activity and the support necessary to complete the experience" (p.9).

These theorists define independence as "the freedom to choose one's own learning objectives, learning activities and methods of evaluation" (p.6). In arriving at this definition, they refer to other definitions and in the process draw attention to the important distinction between a notion of independence that is linked to the condition of studying in physical isolation and another where it is interpreted as the degree of control exerted over the content and method of learning.

Power, they regard as "the ability or capacity to take part in and assume responsibility for the learning process". They explain further that "the power or ability to take responsibility for a learning process can be perceived as the psychological dimension of control". They see the psychological as comprising attitude, emotional maturity, cognitive style, self-concept and motivational level (p.7).

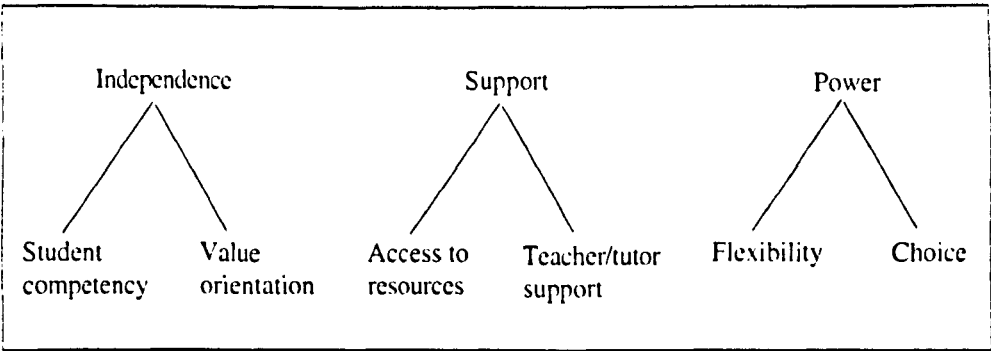
With regard to support, the authors state that it refers to "the resources that the learner can access in order to carry out the learning process". The main sources of support are courses, learning materials and teachers/facilitators. They also recognise library facilities and media as well as the financial and emotional support of family and friends as aspects of support. While acknowledging the value of this wide range of resources, they emphasise that "the role of the teacher/facilitator is of primary importance in the issue of support" (p.7). They admit that attempts to provide this type of support can lead to an increase rather than a decrease in learner dependence on the teacher, but they counter this with the view that "a learner can receive a great deal of help without giving up any of his control or responsibility" (p.192). They maintain that support, as they define it, facilitates greater learner control.

According to Garrison and Baynton, learner control requires a dynamic balance between the three components described above, namely independence, power and support. They assert further that it is realised when there is communication between a teacher and a student and when the teacher is performing more of a facilitating rather than a didactic role.

Empirical study

One of the authors, Baynton, seeks to verify this theoretical model through an empirical study. Through factor analysis, she (Baynton, 1992) not only confirms the existence of the three components of independence, support and power (or competence, as she refers to it) but also identifies a subsidiary layer of six lower level components linked to the original three. The six are student competency, value orientation, access to resources, teacher/tutor support, flexibility and choice (Table 2.1).

Table 2.1: Baynton's enhanced model of learner control.



Of special interest is her finding that, within the support component, students were making a distinction between teacher/tutor support and access to resources. Then, in relation to the teacher/tutor support, she notes that her respondents were making a further differentiation between academic and psycho-social support. She concludes that the control model demonstrates "the interdependence of the teaching/learning process and that it de-emphasises the isolation suggested by the concept 'independence'" (p.29).

Assessment of model.

The model identifies key attributes that can be expected to enhance learner capability to make and/or influence decisions related to their own learning. However the model does not address the ultimate issue of learner performance in this autonomous role in relation to the teacher. Even though the authors state that learner control is manifested in the two-way communication between teacher and student, that communication is never explored. Given the stated significance of this relationship, it seems evident that the learner model ought to have been manipulated in relation to a teacher model to justify claims about its appropriateness. Thus, while Baynton's factor analysis may have served a useful confirmatory function with respect to learner attributes and expectations, it too manifests the same limitations observed at the level of the theoretical model.

The authors also emphasise that there must be a dynamic relationship among the three basic components of independence, power and support. However even though this is clearly stated, the authors do not attempt to go beyond the simple statement of the proposition.

Thus it can be argued that the value of this model lies in its identification of potentially valuable learner-related factors but that it falls short in terms of its ability to demonstrate the relationships to which the model itself draws attention.

Independent interaction..

Juler (1990) uses the term *independent interaction* to describe his perspective of learner autonomy. The significance of Juler's contribution lay in his interpretation of interaction as discourse. His definition of discourse draws on the term's Latin root, 'discursus' which he takes to mean 'a running to and fro' and more specifically the running to and fro of speech between people. Against the background of this concept of discourse, Juler expresses concern about the dominance of institutional texts in the learning experience of the distance learner. He uses the term 'text' to mean anything that is produced in some relatively fixed form by one set of participants with the

intention that other participants should interact with it. He therefore argues that there should be greater recognition of student-created texts.

As a means of further exploring the function of text, he focuses attention on the significance of role in discourse. He specifies two types of roles, namely illocutionary and interactive roles. The former, he explains, implies the right to control the behaviour of another participant and is not necessarily related to the content of the communication. The latter implies the right to control the flow of the discourse, and is reflected in elements such as turn taking and the distribution of utterances among the participants. Juler contends that teachers maintain dominance in both types of roles and that this dominance exists in distance education texts even when there are attempts to encourage independence on the part of students.

As an example, he cites the tutorial-in-print⁴, the in-text device developed by Derek Rowntree of the UK Open University. Juler notes that this device is intended to provide an environment in which a student would have the opportunity to keep coming up with his own ideas and get feedback as to how they compare with other people's.

Juler is not convinced that in-text exercises such as the tutorial-in-print, can ever meet the objectives they are intended to achieve. More importantly, he holds the view that such exercises do not provide students with the opportunity to adopt initiating roles in the discourse. Thus he contends that "the typical in-text exercise presupposes that the text as teacher maintains the dominant role in the discourse" (p.28).

Consequently, Juler advocates what he calls 'independent interaction', involving the creation of environments in which students could create their own texts fairly independently of the institution. He cites and critiques three examples of this type of practice, one of which is the Curriculum Theory course developed by Fitzclarence and Kemmis, in which the developers included a Journal and a Conference as part of the design of the course (see earlier discussion on *dialogue*). To conclude, Juler contends that the organised distance education process should be, to some extent,

⁴ This design strategy will be discussed more fully in Chapter 3.

unstructured and unpredictable, to allow students the opportunity to assume interactive roles in an independent way in the discourse.

Assessment of concept

To some extent, Juler's independent interaction goes further than Garrison and Baynton's learner control in that, by juxtaposing institutional text and student text, it at least draws attention to the imbalance between teacher and student roles in conventional distance education. Further his call for less structure and predictability in the distance education process, suggests a recognition of the nature of the prevailing power relations, with the various examples of independent interaction being presented as ways of adjusting those relations to facilitate greater learner autonomy.

Summary discussion

The two concepts discussed in this section, namely learner control and independent interaction have, in their respective ways, both addressed the issue of learner autonomy within the framework of the interaction between the learner and the teaching system. Of the two, independent interaction comes closer to demonstrating the inter-relatedness between learner and teacher roles and recognising how the nature of this relationship impacts on the capability of the learner to assume initiating positions in the teaching-learning discourse. In this regard, Juler is pointing to the more fundamental issue of power relations which was alluded to by the advocates of dialogue but which was not specifically explored by any of them. Nonetheless, Garrison and Baynton's model provides a reasonably well-articulated framework that can be used to determine adult students' readiness to assume responsibility for their learning.

Conclusion

The respective treatments of social interaction discussed in this chapter have, in various ways, addressed core issues related to the relationships among the participants in a distance teaching-learning context. For example, *collaborative learning* was seen to emphasise the role of the group and the importance of interactive learning; *dialogue* highlighted the notion of the education community; and the issue of learner autonomy was also explored through the concepts of *learner control* and *independent interaction*. However some key questions remain to be answered. For example, what of the relationship that must necessarily exist between the distance learner and the media? This aspect is not addressed in any of the treatments discussed above. Further, do any of these treatments account for learners' engagement with knowledge as they (the learners) involve themselves in the cognitive process of coming to know? It is evident that none of the treatments address the full range of interactive conditions that learners must experience as they seek to extend and/or enhance their knowledge base.

Consequently, there is a need to take a broader view of interaction. In this regard, the study will examine the conception that evolved out of second generation distance education and which still underpins the practice of distance teaching and learning in many parts of the world, even though it has been marginalised in the literature with the current focus on the social.

CHAPTER 3

INTERACTION: A HISTORICAL PERSPECTIVE

Introduction

This chapter begins with an overview of the theory of communication and interaction in distance education as proposed by Holmberg, one of the earlier theorists of distance education. Using the conception embodied in that theory as its base, the chapter proceeds to examine interaction as practised within the industrialised, second generation mode of distance education. As discussed in Chapter 1, this mode is characterised by the mass production and dissemination of courses which are delivered through a combination of one-way media and tutorials. The chapter examines interaction as practised in both of these forms of communication.

Attention is also paid to the concept of transactional distance which is seen as emerging within second generation distance education as a complement to prevailing perspectives on interaction. The chapter then explores two subsequent initiatives at re-defining interaction which are regarded as attempts by the respective authors to counteract the movement towards an exclusive focus on the social and to re-focus attention on prior conceptions. Based on an assessment of these re-definitions, the chapter proposes an alternative perspective.

A theory of interaction

The design of structures to effect two-way communication between learners and the teaching institution has been an important area of study and practice in distance education for several decades. Keegan (1990) has identified the combination of communication and interaction as one of the theories in the field, adding that it has been occupying the attention of distance educators from the period of correspondence tuition.

Keegan highlights Holmberg's guided didactic conversation as one of the major contributions to the development of the theory. Specifically, he points to the distinction

which Holmberg makes between real and 'simulated' interaction, with the former taking place by correspondence, telephone and personal contact and the latter taking the form of internalised conversation by study of a text or the conversational style of the course authors (Keegan 1990, p.89).

The 'simulated' and the real

This two-part conception has exerted considerable influence on practice within second generation distance education. Theorists and practitioners have highlighted the importance of strategies to simulate interaction between learners and the various one-way media. Additionally, attention has been paid to the role of the tutorial in the experience of students. This section addresses these two approaches to the treatment of interaction.

Interaction with one-way media

Print has been the dominant medium of second generation distance education and consequently has been the focus of much of the innovative work in the design of interactive course materials. A key device that was primarily intended to be incorporated into print materials is the tutorial-in-print as designed by Derek Rowntree of the UK Open University.

Tutorial-in-print

This device is based on the principle that teaching in its ideal form would make provision for student input. Consequently, the *tutorial-in-print* is intended to provide various types of stimuli to which students would respond. For example, there would be stimuli that would require students to recall information, conduct their own research, provide their own interpretations of data or generate some novel object. Feedback in one form or another would then be provided to allow students to verify or evaluate their responses. Rowntree himself provides the following explanation:

The tutorials-in-print simulate a dialogue between tutor and student, with frequent requests for the student to make a personal response and the author then continuing with a discussion of possible answers and where they may lead. (Rowntree, 1974, p.119)

As a follow-up to the tutorial-in-print, Rowntree proposes a second device, namely the *reflective action guide*. In distinguishing between the two, he explains that the former is intended for use in situations where there is a defined body of knowledge to be learned and where appropriate responses can be predicted fairly accurately ahead of students actually making the response. On the other hand, the reflective action guide

assumes that the important learning will take place away from the package...

The aim is not primarily to help learners to master an existing body of knowledge so much as to help them pursue a personal project - developing their individual insights, or practising towards some kind of practical competence. (Rowntree, 1994, p.15)

It is evident that this second device is intended to engage the learner in activity that is substantially self-directed. In this regard, it appears to bear a close resemblance to Juler's independent interaction discussed in the preceding chapter.

Implied dialogue

While Rowntree's devices are directly intended to foster learner engagement with and manipulation of the content of the course, Gilliard's (1981) interest is in developing a style for writing course materials that would engender in the learner a sense of being in a conversation with the absent teacher. In this regard he introduces the notion of the *implied teacher-student dialogue* and proposes the use of certain linguistic devices which would serve to engage the student in a simulated conversation with the 'teacher', whether conceived of as being unseen or as embedded in the materials. The devices include the manipulation of verbs and pronouns with increased use of the personalised 'you' and 'we'. In addition Gilliard recommends the use of open-ended

questions and conversational asides in the margin. He sees this technique as serving to reduce the distances whether physical, intellectual or moral between the student and the teaching institution. As noted in Chapter 2, Gilliard's notion of the simulated dialogue was acknowledged by Nation as a factor influencing his own perspective of the multi-voice technique.

Interaction with video

There have also been initiatives aimed at fostering interaction with video-based materials. Crooks and Kirkwood (1988) recommend an approach intended to encourage reflection on and stimulate discussion around video-based course content. They highlight two features of the medium that could be exploited for this purpose. The first is video's capability to impart visually and conceptually dense information, and the second is its pause feature that gives users control over their pace of viewing. Consequently, the authors advocate that content could be designed to allow students to pause at pre-determined, built-in intervals in order to reflect on the preceding segment. They suggest further that interaction could be enhanced through an integration with other media, notably print. Thus, at regular intervals during the study of video-based materials, students would engage in activity presented through the print medium which would be linked to and/or derived from the video content.

Critique of devices

In the view of some theorists, the use of the above-mentioned strategies have, on the whole, not been successful. For example, Laurillard (1993) is not convinced of their effectiveness. With regard to print she asserts,

The addition of in-text activities and all the other add-on features ... do not in themselves change the format of the medium - it is still print, and therefore open to the same distortions as the original simple text. (p.111)

She has a similar perspective about video. Referring specifically to the stated advantage of the pause and rewind feature, she argues, "Nothing in the video changes

when a student rewinds it, just as nothing in a book changes when you turn a page". She states further, "The medium cannot itself provide intrinsic feedback on what the student is doing. It is 'active video' perhaps, but not 'interactive video' (p.117).

Other theorists, while not as dismissive, also express their own concerns about the usefulness of devices to facilitate interaction with print. Lockwood (1992), in commenting on in-text activities, contends that,

learners are able to perceive both the benefits to their study that activities offer, and recognise the potential cost of responding to them ... The vast majority of learners operate a balance ... responding to some activities and not to others as study time pressures and the perceived value of benefits vary. (p.114)

Based on his own research, he contends that there are five factors that are likely to influence a student's decision to do in-text activities. He lists these as,

1. Temporal - the time associated with an activity; whether it is brief or lengthy.
2. Operational - the method of responding to the activity.
3. Typographical - the presence or absence of a framework to record a response.
4. Positional - the relative position of an activity in the teaching material.
5. Intellectual - the demands made by the activity. (Lockwood 1992, pp. 120-121)

Marland, Patching, Putt and Putt (1990) provide parallel perspectives. Based on the findings of their own study into student interaction with print, they make the observation that,

the search for understanding by students did not extend much beyond the micro-level, that is the single word or single phrase level. There was little evidence that students sought to develop a broad, integrated understanding or interpretation of substantial blocks of text. Themes, theories and issues were not identified. (p.84)

Consequently they emphasise the need to,

structure text in a way that emphasises a cumulative, interactive organic view of learning rather than a view of learning as the acquisition of isolated bits of knowledge, [to] use outcomes of in-text activities as prerequisite knowledge for further study, and [to] make completion of some in-text activities compulsory.
(p.86)

It is evident from the above discussions that in-text interactive devices have been an area of concern for distance educators. However, it would appear that this aspect of the distance education experience no longer holds the interest of researchers in the field. Given the reality that pre-packaged materials continue to be an integral part of the practice of distance education in many parts of the world, there is an ongoing need to investigate the capabilities of these devices in enhancing the learning experience of the isolated learner.

Interpersonal Interaction

In second generation distance education, interpersonal interaction takes the form of face-to-face tutorials, correspondence tuition, through which students receive feedback on their assignments and telephone contacts: it occupies a secondary position to interaction with the course materials and there are those who are not satisfied with that relationship. For example, Thorpe (1979) asserts,

When people talk about (UK) Open University courses, the implicit assumption most often seems to be that the course is the materials - and the correspondence units in particular. This seems to me too narrow a view of what the course is, and by extension who 'produces' and who 'maintains' it. A course is not the correspondence units, texts and course-related materials produced by the course team: it is not a set of products, but a process which 'happens' every academic year through the interaction of students, tutors and the course team, based on the course produced by the centre. (pp. 13-14)

Echoing Thorpe's statements, Tait (1988) expresses his own concern about the tutor role, arguing for a meaningful relationship between that role and that of the course materials. He contends,

The mediation and interpretation of course material by the tutor represents a central function in promoting the independence of the learner, and in supporting educational practice which can be termed 'democratic'. (p.97)

In a similar vein, Lentell (1994) argues that,

important though all the services offered in distance education are, however splendid the printed texts, however smooth the organisational system, and however refined the quality of the measurement tools, it is the relationship between the tutor and the learner that determines success or failure. (p.50)

These three comments, spanning a period of some fifteen years, suggest quite strongly that the tutorial is seen as being marginalised. Indeed when one examines other contributions on this topic, one gets a sense that the respective writers are seeking to justify the existence of this aspect of the distance education experience, to enhance its status and/or to ensure its retention.

Comments on tutoring function

Daniel and Marquis (1988) highlight the significance of interpersonal contacts for the distance student as they argue for a balance in provision between systems that cater for learner independence (that is, the student working alone) and those that cater for interaction, (namely activities that bring the student into contact with other people). As examples of independent activities, they cite the use of broadcasts and audio-visual materials, as well as essay-writing and other forms of student-produced assignments. With regard to interactive activities, they rate the summer school idea very highly and also outline strategies for conducting counselling and tutoring sessions.

Wright (1989) sees the need to improve on the tutorial and suggests ways in which this can be done. He advocates group interaction and provides guidelines for

managing what he refers to as the group-based tutorial approach to allow for learning in well-defined stages of individuals working alone, then in groups of two, and ultimately within the larger group. Wright sees the process as helping to reduce the student-tutor dependency and facilitating the building of more autonomous adult-to-adult relationships.

Assessment of the tutoring function

It is worth noting that in neither of the discussions of the respective types of interaction is there any attempt to examine the type being discussed in relation to the other. The proponents of the use of interactive in-text devices never refer to the tutorial; many of those who focus on the tutorial, seek to define it almost independently of the course materials. There is no clear evidence of an integrated perspective.

It can be argued that the problems ascribed to the tutoring function stem not so much from its secondary position in relation to the course materials, but rather from the fact that the relationship between the two has never been adequately defined. It would appear that the tutorial is intended to perform a compensatory function in the life of the distance student, alleviating the unavoidable difficulties associated with studying in isolation. The tutor/counsellor must therefore help the students understand the content of the course materials, improve their study skills, manage their personal lives and communicate efficiently with the teaching institution. It is likely that these functions do not allow the tutorial to be seen as an integral part of the distance education experience. Consequently, it would seem that, as was suggested by Tait, there is need to re-define the role of interpersonal interaction in relation to the other components of the second generation system.

Comparing two perspectives

There are two important ways in which the current dominant perspective on social interaction differs from the tutorial. First, as noted above, the tutorial is subsidiary to the course materials. To a greater or lesser degree, the functioning of both

the tutor and the student in the tutor-student interaction is dominated by the larger teaching function embedded in the course materials. On the other hand, within the third generation system, social interaction is at the core of the distance learning experience. In fact it is the course materials that occupy the subsidiary position.

Secondly, the new thinking favours a direct link between the learner and the originators of the teaching-learning experience. Such contacts are not a feature of the traditional system: the course developer is not normally expected to interact with the students.

Thirdly, probably because of its emphasis on direct person-to-person contact, the third generation concept accords a high priority to issues regarding effective communication among participants and the structuring of the social environment within which the communication is taking place. While acknowledging the contribution of Wright, cited earlier, matters related to communication are not given much consideration in the second generation perspective of the interpersonal.

Summary discussion

The approach to the treatment of interaction in second generation distance education strongly reflects the influence of Holmberg's guided didactic conversation. Specifically, Holmberg's real and 'simulated' interaction are reflected respectively in the tutoring function and in the design of course materials.

Whatever the concerns raised about these two types of interaction, they are both informed by an underlying perspective that warrants articulation. First, the goal of interaction is to bring about learning, that is, a change in the learner's knowledge base. Tutorials and in-text devices are both intended to serve this purpose. Secondly, it is recognised that learners engage in different kinds of interactive experiences for the purpose of learning and this is reflected in the formulation of the concept.

While recognising the value of a broader conception of interaction, there are two areas in which one can detect some conceptual limitations in this two-part construct. There is no doubt that theorists and practitioners who subscribe to and implement this

two-part concept, are sensitive to the relationship that must exist between the distance learner and the media. However, the manner in which they articulate that relationship indicates a greater focus on the content embedded in and transmitted through the media and only minimal attention to a relationship between the learner and the media themselves. In conceptualising interaction for learning, there is need to recognise a learner-media relationship.

Secondly, subsumed within both types of interaction identified is another set of interactive conditions, which ought to be recognised. Specifically both interpersonal and media-based interaction provide opportunity for synchronous and asynchronous interaction but neither of these conditions are acknowledged in the discussions. Whether interaction takes place in real-time or is delayed, holds important implications for the decisions that must be made for the design of learning experiences and warrants some consideration in the development of the concept.

Transactional distance

Moore's (1983) notion of *transactional distance* can be regarded as a necessary complement to interaction as described above, serving as a check on the roles that teachers and learners occupy in relation to each other within a teaching-learning transaction.

Moore explains that this construct is a function of the interaction of two variables, namely *dialogue* and *structure*. He says that "dialogue describes the extent to which, in any educational programme, learner and educator are able to respond to each other". He further explains that dialogue is determined by the content, the educational philosophy of the educator and learner, and by environmental factors, most notably the communication media. Structure he defines as "a measure of an educational programme's responsiveness to learner's individual needs". He explains further that structure reflects the extent to which educational objectives, teaching strategies and evaluation methods are prepared for, or can be adapted to the objectives of the learner". He notes, for example, that in a highly structured educational programme, objectives

and methods are determined for the learner and are inflexible (p.157).

It is important to note that transactional distance does not embody a view of distance as physical separation. Rather distance is presented as a measure of the extent to which dialogue and structure vary in relation to each other. Consequently transactional distance is applicable whatever the spatial distance between teacher and learner.

Empirical study

Saba and Shearer (1994) using a system dynamics model, undertook a study to test the concept. The researchers describe system dynamics as "a technique for translating intuitive models into causal loop diagrams" (p.38). They explain further that the causal loop diagrams make it possible to observe the effect of one system component on other functions. They selected this methodological approach because it could handle data collected on several variables and facilitate analysis of the interrelationship among the variables over time. This latter feature was seen as being particularly important for the study of Moore's model since, as they assert, the variables of *transactional distance*, *dialogue* and *structure* are not static but change over time, depending on the nature of the interaction between teacher and learner.

Their hypothesis was that the level of transactional distance can be controlled by varying the rate of dialogue and structure. Their model comprised three levels, with each level having its associated rates. The three levels were transactional distance, learner control and instructor control. Structure and dialogue were designated as the rates for transactional distance; active and passive, the rates for learner control; and direct and indirect, the rates for instructor control.

The model was tested in an experimental situation in which a single instructor interacted with each of thirty students, one at a time, on a prototype workstation that integrated data, voice and video. The respective students and the instructor worked from different locations but could see and speak to each other through the system. Their instructional transactions were videotaped and the content was classified using

discourse analysis strategies.

Based on their findings, the researchers were able to confirm Moore's theoretical proposition and their own hypothesis that transactional distance varies according to the rate of dialogue and structure. The model demonstrated that as learner control increases, the rate of dialogue also increases, resulting in a decrease in the level of transactional distance. Conversely, as instructor control increases, the rate of structure increases, leading to an increase in the level of transactional distance. It would be worth investigating whether, outside of this experimental situation, a teaching-learning system that functions with a high degree of structure, is capable of making the adjustment to accommodate higher levels of dialogue, and thereby decreasing the transactional distance between teachers and learners.

Summary discussion

Essentially, transactional distance is addressing a concern similar to that discussed by Garrison and Baynton, and Juler, cited in Chapter 2. As in the case of 'learner control' and 'independent interaction', it pays attention to the extent to which learners are able to take the initiative in guiding their own learning experiences.

It is interesting to note though that of the three, transactional distance goes furthest in acknowledging the interplay between the competing forces of learner agency and institutional control. While it does not fully address the issue of power and control, its inclusion of the teaching function in its conceptualisation, demonstrates an awareness that, in the context of formal education, issues of learner autonomy cannot be addressed in isolation of the teacher role.

Also of interest is the fact that transactional distance, like learner control was tested empirically. However, while Baynton uses factor analysis to confirm attributes of the theoretical construct of her interest (learner control), Saba and Shearer go further, using a modelling strategy to verify the nature of the relationship among the constituent components of transactional distance.

At both the level of theory formulation and at the level of empirical study, transactional distance can be said to reflect a greater sensitivity to the complex and dynamic nature of the real-world teaching-learning situation than does learner control.

Revisiting the theory of interaction.

As noted above, it was probably in an attempt to counteract the emphasis on the social that Bates (1990) and Moore (1989) respectively embarked on a redefinition of interaction. It is likely that these two theorists saw the focus on the social as representing a substantial shift away from what had been implicitly accepted in the field and were therefore seeking to re-establish and give renewed impetus to the conventional way of thinking. Thus Bates proposes two contexts for interaction and Moore, three types of interaction.

Two contexts for interaction.

Bates appears to have strong reservations about the exclusive focus on the interpersonal. In a virtual re-statement of Holmberg's thesis, he asserts,

In effect there are two different contexts for interaction: the first is an *individual*, isolated activity, and that is the interaction between a learner and the learning material, be it text, television or computer program; the second is a *social* activity, and that is the interaction between two or more people *about* the learning material ... *both* kinds of interactional context are necessary for learning and both need careful examination. (p.5)

He pays special attention to the first context and emphasises the importance of in-text design features. He asserts that "What differentiates distance learning texts from other kinds of printed material is a deliberate attempt to structure explicitly a student's response to the material" (p.8). He lists a series of techniques to foster this response, including explicit objectives, headings and self-assessment questions within the text. He regards these design features as being essential for the (largely isolated) 'long

distance learner'.

With regard to the second context, he identifies three types of social interaction, namely interaction between the learner and the originator of the teaching material, between the learner and a tutor, and between the learner and other learners, all of which can take place either through face-to-face contact, or at a distance mediated through the appropriate technologies. It is interesting to note that Bates includes person-to-person interaction between the learner and the originator of the teaching material, an aspect that is not a feature of the second generation tradition out of which he has derived his own perspective. No doubt Bates is recognising the need to acknowledge the emergent practice of the third generation system.

Three types of interaction.

Moore (1989) provides a complementary though not identical perspective. He identifies three types of interaction: learner-content interaction, learner-instructor interaction, learner-learner interaction. He sees the first as serving a largely didactic function and, except for the interactive video disc, he holds the view that all the content-bearing media are limited in that they are only capable of providing one-way communication with the learner. He acknowledges the importance of design features to simulate interaction in learning materials. However, he has his doubts about their effectiveness, stating that "the lack of feedback from individual learner to educator makes these teaching procedures very generalized ... leaving ultimate responsibility for maintaining motivation, for interacting with the presentation ... on the learners themselves" (p.3).

He says of the second type (learner-instructor) that it is "regarded as essential by many educators and as highly desirable by many learners" (p.2). He states further,

Where interaction between learner and teacher is possible through correspondence or teleconference, the learner comes under the influence of the professional to interact with the content in the manner that is most effective for that particular individual learner" (p.3).

He regards the third type, learner-learner interaction, as a new dimension of distance education "that will be a challenge to our thinking and practice in the 1990s" (p.4).

Moore's assessment of the three types that he has identified strongly suggests that, while his conception of interaction may have its origins in the second generation practice, he is probably at the time of writing at the cross-roads and tending more towards a third generation orientation, with its emphasis on the social. Nonetheless he concludes his discussion by acknowledging the relevance of all three types.

Critique of Bates and Moore.

The value of both these definitions of interaction is that, like the practice from which they were derived, they are grounded in the perspective that interaction for learning involves the learner in different types of interactive experiences and that these should be reflected in the stated attributes of the concept.

Notwithstanding the worthwhileness of this underlying principle, there are factors in the respective treatments which can be said to limit their capability to provide an adequate conceptual framework for the study and practice of distance teaching and learning. The following areas stand out.

First there is the question of precision and rigour in the concept formulation exercise itself. Moore's treatment in particular betrays some weakness in this regard: there is a certain element of overlap between two of the three types. It is doubtful whether there is any justification for the separation that he makes between learner-instructor interaction and learner-learner interaction. It can be argued that there is no fundamental difference in terms of the processes involved when learners are communicating among themselves and when they are communicating with their teachers. The two are simply variations of social (interpersonal) interaction and are not conceptually exclusive of each other.

At the level of concept formulation, in one of Moore's types, there appears to be a certain element of mismatch between the name of the type and its stated properties.

Moore names one of his types learner-content interaction but a substantial portion of the related discussion deals with the media in which the content is embedded and through which it is made available to the learner. Specifically the discussion fails to explore what learner-content entails.

This perceived flaw has implications beyond the level discussed above. Moore's discussion of media-related functions even when he has not specified a type of interaction with that name, can be regarded as an indication that there is need to recognise a learner-media interaction. A parallel observation was made in the earlier assessment of interaction as a second generation concept. There, it was noted that, in their discussion on interaction with course materials, theorists and practitioners were focusing more on an interaction with content than on one with media. My position is that there is an important media dimension in interaction for learning that requires articulation in its own right.

Conceptual weaknesses are also evident in the first of Bates' two contexts. Bates describes his first context for interaction as an individual isolated activity, which, he explains, involves "the interaction between a learner and the learning material". It is very likely that Bates chose the label as a means of emphasising that the learner studying the course materials on his or her own, represents an important aspect of the distance learning experience. However, by letting this particular set of circumstances influence his labelling of the context, Bates, has found himself in a position of not doing justice either to the label itself, or to the circumstances that he evidently wants to highlight.

Studying the course materials cannot be regarded as the only kind of activity that qualifies for the label 'interaction as an isolated activity', even if, as is the case here, one is restricting one's discussion to learning in a formal education setting. The label, if taken without its author's explanation, can equally be interpreted as the individual engaging with the self. If one accepts that interpretation, then an individual does not need to be in contact with the course materials in order for that intrapersonal engagement to take place. If, however, the primary intention is to project the activity of

learner engagement with course materials as an interactive process (as suggested by the explanation), then the label 'interaction as an isolated activity' does not adequately reflect that intention. It may be more appropriate to label this materials-related activity 'learner-content interaction', using the label coined by Moore.

Having suggested that name change, it can be argued that too much emphasis is being placed on the course materials, and by extension, on the content which they embody. While not underestimating the importance of the subject matter content in the distance learning experience, it is more appropriate to think in terms of the learner engaging with knowledge at the internal level since it is that internal activity that most directly influences change in his or her knowledge base. This perspective is also held by Harri-Augstein and Thomas (1991) whose work will be discussed in Chapter 5.

The point being made therefore, is that, in the context of learning, there is an interaction that takes place within the individual, that it needs to be recognised and that it is more appropriate to articulate that internal interaction in terms of the knowledge-building function that it entails. Consequently, the label learner-knowledge interaction is being proposed as a replacement for learner-content interaction as a means of giving clearer articulation to the essential meaning of Bates' 'interaction as an isolated activity'. Specifically this new label is being used to refer to the learner's interaction with knowledge as an internal cognitive activity.

Conclusion

This chapter set out to examine alternative conceptions of interaction for distance learning in the light of limitations noted in social interaction. It also continued the secondary discussion on control in its assessment of Moore's transactional distance. What is significant about this latter concept is that its twin components of dialogue and structure reflect an awareness that issues regarding learner control and learner autonomy can only be addressed adequately when both teaching and learning functions are examined in relation to each other. Specifically in a formal teaching-learning setting, the role and status of the learner is best understood when viewed in relation to the role

and status of the teacher.

With regard to the primary area of discussion, this chapter has acknowledged the value of conceptualising interaction as a multi-faceted construct but has recognised weaknesses in prevailing conceptions that are based on this notion. Consequently an alternative concept is being proposed. Drawing on my own appraisal of what currently exists, I am proposing a three-part concept comprising social interaction, learner-media interaction and learner-knowledge interaction and the remaining chapters of the literature review will be devoted to exploring this revised concept.

I am also proposing that any discussion on interaction must also take into consideration issues of power relations. In addition, while acknowledging learner-knowledge interaction as an internal cognitive activity, it is also evident that external sources of knowledge, whether provided through the official course content or otherwise, would of necessity play some part in the overall interaction.

In light of all of the above, this chapter recognises the discussion of Chapter 2 as addressing issues related to social interaction. Chapter 4 will deal with the second aspect of the re-defined concept, learner-media interaction and Chapter 5, the third, learner-knowledge interaction. Chapter 5 will also examine power and control in a more focused way than has been the case up to this point. In addition it will seek to assess the nature of the external knowledge which, as was suggested earlier, needs to be considered in relation to the internal activity, learner-knowledge interaction.

CHAPTER 4

LEARNER-MEDIA INTERACTION

Introduction

This chapter examines the perspectives of different theorists regarding the role of media in the learning process and the nature of learners' engagement with these technologies. In this regard the chapter explores three areas of study. The first deals with the issue of whether it is the design of the media product or the inherent attributes of the media themselves that influences learning. The second explores learning within the environment of the interactive technologies and the third examines the design of a media classification scheme based on a model of the learning process.

An interpretation

The traditional definition of media in the learning process derives from a largely transmission-reception perspective of teaching and learning. Consequently media are seen as the channels that facilitate the transfer of information from an originator to a recipient. Given this perspective, both human beings and technological objects can be regarded as media since both are capable of performing this transfer function (Romiszowski, 1988).

By comparison, more recent conceptions present the relationship between learner and media as being complementary, with processes activated in the learner being supported by other processes in the media to facilitate the construction of the learner's knowledge base. Consequently media are seen as supporting a range of teaching-learning tasks including but not restricted to information transmission-reception. The discussion in this chapter will be informed by the latter perspective.

In addition, while acknowledging that human beings and the media technologies both have the capability to perform a mediating function, a distinction needs to be made between the two. Given the unique capabilities of the technologies as well as the varied

demands of open and distance learning, a distinction must be made between the functions that are performed in the interaction of human beings and those that occur in the relationship between human beings and the technologies. Consequently, in the context of this study, the term 'media' applies only to the non-human mediating objects.

Media influence on learning: a debate

This debate, which did not emanate from the field of open and distance learning, but which is nonetheless very appropriate, concerns the effect of media design strategies and media attributes respectively on learning. Two key discussants in this debate have been Richard Clark and Robert Kozma.

On the one hand, Clark (1994) asserts that it is media design rather than media attributes that influence learning. In this regard, he repeats his widely quoted statement that "media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition" (p.22).

Thus, focusing on design, Clark claims that "any necessary teaching method could be designed into a variety of media presentations" (p.22). He adds,

If learning occurs as a result of exposure to any media, the learning is caused by the instructional method embedded in the media presentation. Method is the inclusion of one of a number of possible representations of a cognitive process or strategy that is necessary for learning but which students cannot or will not provide for themselves. (p.26)

By contrast Kozma, (1994) favours a focus on the role of media attributes. He holds strongly to the view that if, as Clark claims, there is no necessary relationship between media attributes and learning then there ought to be one. He makes this assertion based on his assessment of the growing impact of the communication technologies in the broader society. He speculates that more sophisticated media

combinations are likely to be widely available in the future and in that context he cautions, "If we have not *forged* a relationship between media and learning - this capability may be used primarily for interactive soap operas and on-line purchasing of merchandise with automatic funds transfer" (p.8).

He contends that the failure to forge this link lay in the behavioural roots of the media research agenda with its strong stimulus-response methodological approach. He rejects the perspective of learning as a receptive response to the delivery of instruction and asserts instead that "learning is an active, constructive, cognitive and social process by which the learner strategically manages available cognitive, physical and social resources to create new knowledge by interacting with information already stored in memory". On the basis of this view of learning, he contends that "we will understand the potential for a relationship between media and learning when we consider it as an interaction between cognitive processes and characteristics of the environment." (p.8).

With specific reference to the media, Kozma draws attention to what he regards as their cognitively relevant capabilities or attributes. These he identifies as the medium's technology, its symbol systems, and its processing capabilities. Technology refers to the physical, mechanical or electronic capabilities of the medium which determine its function; the symbols systems are the expressions by which information is communicated, for example, spoken language, maps, graphs; the medium's processing capabilities refer to its ability to operate on available symbol systems in specified ways, for example to display, receive, transform or evaluate information. Kozma therefore argues that each medium is distinguishable in terms of its unique capabilities and that a particular medium can be described in terms of its capability to present representations and perform operations in interaction with learners who are themselves constructing representations and operating on them.

Summary discussion

There are two factors distinguishing the perspective of these two theorists that are worth noting. The first is that Clark's focus appears to be biased towards the outcome of learning and the need to influence that outcome through the implementation of appropriate methods. On the other hand, Kozma's approach does not reflect a concern for outcomes; rather he is concerned with the process of learning. Secondly, Clark sees media as performing a compensatory role, supplanting the cognitive capabilities that the learner does not have, relative to a given task. Kozma however, projects a more equitable relationship between learner and media that involves an interaction of their respective capabilities in a complementary fashion.

In spite of these differences, there is a fundamental similarity in that both theorists are acknowledging that learning entails an interaction between learner and medium. With regard to the perceived difference between their respective positions about learning as outcome and learning as process, it can be argued that both perspectives can be applicable depending on whether one is looking at the teaching-learning situation from a macro perspective, examining the learning process as a whole, or from a micro perspective, focusing on media use in relation to specific learning goals. At the level of practice, there may be greater integration between the two than is acknowledged in this debate.

Learning in interactive technological environments

The notion of an interaction between learner and medium that is seen to characterise the discussion between the two preceding theorists does not readily apply when one considers learning in the telecommunications and computer-networked environments. In fact the term 'media' can be regarded as a misnomer in its extended application to these new technologies. For example, it is evident that there are sufficient conceptual and functional differences between video and video-conferencing to suggest that both cannot be adequately classified under the same label.

An important feature of the discussion on these new 'media' is that they are seen as environments that facilitate social interaction within which learning takes place. In most instances however, as was evident in the discussions on collaborative learning, the focus is on interaction at the interpersonal level with little or no attention being paid to the likelihood of any interaction between the learner and the technology that is facilitating the social interaction.

Wagner (1994) seeks to extend the discussion on interaction as it applies to learning in these conferencing environments and in particular to audio-conferencing. In her discussion, she uses the terms *instructional interactions* and *system interactivity* to describe different types of interaction that take place within the environment. Referring to the former, she states that "[this type of] interaction functions as an attribute of effective instruction". and in the case of the latter, she explains that "interactivity functions as an attribute of instructional delivery systems, particularly those that use telecommunications technologies" (p.7).

Wagner conceptualises system interactivity as operating almost exclusively at the level of the technology with teacher and learner making no significant contribution to its function. Then, based on that interpretation, she proposes the Interactive Information Transport Model which she designed to represent how the audioconference technology functions in supporting instructional interactions. Even though Wagner recognises a media-related interactive function, she still does not identify a direct learner-media interaction component as a feature of interaction in an audio-conferencing environment.

To the extent that there is a media-dimension in the way most discussants examine interaction in these environments, it can be said that it is implied in issues raised about synchronous (real-time/time-dependent) and asynchronous (delayed/time-independent) interaction that the technologies are respectively capable of supporting.

The ensuing discussion is therefore geared to exploring these two interactive conditions, and to assess the extent to which their respective treatments in the literature provide scope for entertaining a notion of learner-media interaction.

Synchronous interaction

Audio-conferencing appears to be the more widely studied of the two synchronous technologies. Indeed, Moore and Thompson (1992) have been able to identify and review a substantial body of literature on the topic dating back some two decades. My own review has revealed two approaches to the treatment of the topic. On the one hand, there is a considerable body of writing promoting the technology and on the other, a minority seeking to analyse learning in its environment.

Promoting audio-conferencing

Lampikoski (1992) leaves no doubt that he is a strong advocate of audio-conferencing as evidenced in his description of the initiatives taken by a training agency with which he was associated, to convince its clientele of the value of audio-conferencing. He justifies the agency's decision to change to this mode of delivery on the grounds that "synchronous distance learning brings with it the opportunity to transmit information simultaneously - to large audiences if necessary". The writer asserts further that "teleconferencing, and two-way radio and cable TV teaching, have the considerable benefit of almost being face-to-face teaching situations" (pp.188-189).

Because of some resistance among students, the training agency set about to investigate the probability of ultimate acceptance of the media and conducted a study based on the following hypothesis:

In spite of the initial negative attitude, the majority of tele-teaching students will find tele-teaching a positive experience when gauged by their feedback. (p.191)

Needless to say, the hypothesis was strongly supported by the results of the study.

While this extreme promotional approach is the exception rather than the rule, it is not unique in its very overt intention to justify the use of this medium. Moore (1994), drawing on the experience of his own practice, gives his personal endorsement to audio-conferencing. He asserts, "Audio-conferencing is a learner-centred, relatively

inexpensive, robust and flexible medium that can be well integrated with other media in a distance education program". (p.1). He then devotes the rest of the editorial to an explanation of each of the qualities identified in this assertion, namely its learner-centredness, the fact that the medium is inexpensive and that it is robust and flexible.

To illustrate the medium's learner-centredness, he describes a typical teaching-learning situation. He says,

In teaching about education, for example, what I typically do in my audio-conference classes (most of which last for at least three hours), is introduce a subject and then set a task, or a problem, or a question for distant groups to discuss or investigate, or in some other way to work on independently. Then I bring the groups together and conduct a period of comparing and contrasting results of group activity, in this way leading participants in a discovery of knowledge. My teaching is based on a series of carefully selected questions and a process of inter-student interaction and guided discovery (pp.1-2).

From his description of his teaching strategy, one gets the impression that first, Moore is presenting this as an example of successful practice and secondly, that to a large extent, he is attributing this success to the fact that all the students are able to participate in the experience simultaneously within a specified three-hour period. Synchrony is seen as a core contributing factor to the meaningfulness of the teaching-learning interaction.

To conclude the editorial, he emphasises that a media mix is important and that "if courses are well designed and interactions well conducted, distance education based on an audio-conference system will be cost effective and efficient" (p.4). It would appear that in the media mix, Moore sees audio-conferencing as being the central medium.

While Moore argues on the basis of practice, Anderson and Garrison (1995) seek to determine the value of the medium through research. The methodology that they used consisted of an initial mail survey followed by a combination of field

observations, interviews and focus groups. The overall aim was to examine how the audio-conferencing environment facilitates the development of a community of inquiry and critical thinking skills among students. The idea for the study emerged out of the researchers' conviction that "the defining characteristic of audio-conference-enhanced distance education is a substantial increase in human interaction: this increase has the potential to markedly change the nature, practice and context of the distance education experience" (p.29).

The target objective of the study was to examine the relationship between students' perceptions of their learning and the teaching-learning strategies employed in the audio-conferencing context. One specific finding of the study was that 83% of the students, responding to open-ended questions as well as interviews, demonstrated an appreciation of the pacing that accompanies a regularly scheduled teleconference course. Based on the overall results, the researchers concur that a community of inquiry exists when there are frequent audio-conference meetings, when there is no directed learning package, when there is an emphasis on developing a stable 'virtual' classroom milieu, when learning activities are designed to bring out and develop group skills and knowledge, and finally, when teacher and students share in determining course content and evaluation.

On the basis of a strong endorsement of the medium by the students of the study, Anderson and Garrison assert that "it is presumptuous of educators to assume that total independence of time and location is the most desirable or the most effective method of delivering quality distance education" (p.40). This remark shows clearly that these writers have little regard for human interaction that does not occur in real time (see also Garrison, 1990, cited earlier).

Assessment of comments

When the above contributions are taken collectively, what emerges is that the use of this synchronous technology is being advocated based on a series of capabilities that are only loosely related to one another. Specifically, there are claims that the

technology can allow for simultaneous transmission of information to large audiences; can facilitate the implementation of a teaching strategy that combines teacher introduction of task across all sites with subsequent simultaneous site-based group activity; and can encourage the design of learning activities that can bring out and develop group skills and knowledge. Unfortunately, no attempt is made in the respective contributions to analyse the features of the technology that make it capable of facilitating any of these activities. Neither is there any mention of any likely effect that the learners' behaviour within the environment could have had on their performance of these activities. In short, it is likely that there is an interaction between learner and the audio-conferencing technology but this has not been explored.

Analysing learning through audio-conferencing

In contrast to the above, Cookson and Chang (1995) provide a more analytical treatment of the attributes and functions of audio-conferencing. These researchers set out to develop "an instrument appropriate for the tabulation, analysis and interpretation of audio-conferencing instructional interactions" (p.18). Of interest in this regard is the distinction that they make between social interaction and instructional interaction. Social interaction, they state, refers to the interpersonal communication that takes place between individuals in social settings. They apply this definition both to face-to-face communication as well as to communication mediated by the interactive technologies. Instructional interaction, they state, refers specifically to "interpersonal transactions associated with the processes of teaching and learning that occur within an instructional setting" (p.19).

Description of MACS

They build their own analytical framework, namely the Multidimensional Audio-conferencing Classification System (MACS), drawing on the above definitions as well as other understandings of the concept of interaction. In this regard, they identify two sets of structures in social interaction, namely contextual structures and interactional structures. The former, they state, comprise aspects of culture and society

and refer more specifically to the power relations derived from that wider socio-cultural setting: interactional structures are seen as being situation-specific or episode-specific.

Their framework is also influenced by Moore's (1989) three types of interaction discussed earlier, as well as by four "critical conditions of audio-conferencing", which they define as mediation by technology, challenging administrative arrangements, the absence of a visual channel of communication and the geographical dispersal of the instructor and the learners. The inclusion of these four critical conditions in the design of the MACS is worth noting. Their articulation suggests that the authors are recognising attributes of audio-conferencing that can impact on learning.

All of the above influence the design of MACS which itself comprises five components, namely instructional interpersonal interactions, source of communication, target of communication, instructor/participant responses to distance, and instructional procedures. The researchers also list subcategories within each of these components. For example, 'instructional interpersonal interactions', which is the core component of the system, comprises five dimensions namely the social-emotional dimension (positive and mixed), the task-area dimension (attempted answers), the task-area dimension (questions), the social-emotional area dimension (negative and mixed) and miscellaneous. Each of these dimensions is reflected in specific types of behaviours. Consequently across all dimensions of the instructional interpersonal interactions component, there are 20 types of behaviours

Cookson and Chang see their system as being important in the light of the growing trend in the USA for conventional universities to incorporate audio-conferencing into their teaching-learning programmes, as they transform themselves into dual mode institutions.

Assessment of MACS

The work of these two researchers introduces an important dimension into the examination of this medium. Specifically it offers practitioners and researchers a tool that is potentially capable of facilitating evaluation of teaching-learning processes in an

audio-conferencing environment. They emphasise that their work was still in progress at the time of writing, and they admit that there were problems in applying the instrument during initial testing. It is likely that these problems were as a result of the very complexity of the instrument. The researchers' attempt to incorporate attributes of social interaction, instructional interaction and the audio-conferencing technology itself, all in fairly substantial detail, is probably too ambitious. Nonetheless, the direction that they take significantly enhances the research agenda of interaction in the context of the interactive telecommunications technologies. More specifically, one aspect of their research design, namely the articulation of the four critical conditions of audio-conferencing, suggests that they recognise a relationship between the learner and the technology.

Perceptions about synchrony

An important factor evident in all of the above contributions, is the taken for granted belief, whether stated or implied, that a face-to-face situation provides the ideal teaching-learning environment and that, as far as possible, distance education should aim to emulate it. Thus, what really recommends audio-conferencing, is its perceived ability to reconstitute an environment that closely resembles the face-to-face classroom situation.

In contrast, I have suggested elsewhere that "real-time interaction cannot and does not sustain all the relevant cognitive processes required in most knowledge-building activities", and that, "this is especially so where one is dealing with knowledge whose boundaries are more fluid than fixed" (Kuboni, Jan. 1996). The reflection and consolidation that is required in any learning situation cannot always be accommodated in a real-time interactive situation. At times there may be a need for information to support the reflection that is not accessible at the moment. At other times, participants may simply need to distance themselves and draw on their own internal cognitive resources in order to enhance their participation in the interaction. Whatever the reason, delayed interaction ought to be given equal consideration in the design of learning

experiences.

Asynchronous interaction

The treatment of the asynchronous technologies in the literature closely parallels that observed for the synchronous. The discussions are largely prescriptive and promotional with a limited orientation towards the analytical. A notable difference between the two sets of discussions though is that, in the case of the asynchronous, greater attention is paid to identifying (though not necessarily examining) the attributes of the technology and their respective functions in supporting the learning process.

The asynchronous environment most discussed in the literature reviewed is conferencing as provided through computer mediated communication systems (CMC). As noted earlier, computer conferencing is identified as the environment most suited for supporting collaborative learning.

Promoting computer-conferencing.

Gunawardena (1991), cited earlier, discounts the value of the real-time interactive technologies, stating that they are usually only capable of one-to-one communication and are thus ill-suited for co-operative learning between groups of learners located at different sites. Like other advocates of collaborative learning, Gunawardena places a high priority on group activity and thus strongly favours the capability of CMC to support many-to-many interaction and more specifically to provide for this in a conferencing environment that can be accessed by the respective participants at any time. The conferencing features that she highlights include directories of users and conferences, conference management tools, search facilities, and the ability to customise the system with special commands for specific groups. Of course, the overall recommending factor is that the CMC system is not time-bound. She asserts that "the asynchronous feature of CMC systems ... offers an advantage in that the CMC class is open twenty four hours @ day, seven days @ week to accommodate the time schedules of distance learners" (p.14).

Klemm and Snell (1995) echo these views about CMC. Like Gunawardena, they hold the view that the CMC conferencing capability has important advantages, but they also caution that there is need to structure it efficiently in order to derive optimum benefits from it. They are critical of existing CMC systems since, in their view, these do not provide an adequate conferencing environment and they cite the sequential threaded-topic discussion format, derived from the basic e-mail system, as being the source of this inadequacy. While they acknowledge that what obtains in most CMC environments is an enhanced version of the basic e-mail format, they maintain that the structure is still basically linear and this they regard as a limitation.

Against this background, they propose their FORUM software which they regard as an advancement in that it provides hypertext linkages among information items, which the authors regard as an improvement on both the linear organisation of the e-mail format as well as the rigid hierarchy of bulletin boards. To illustrate the FORUM structure, they describe the conference which they had set up for one of their courses (Klemm and Snell, 1996).

The conference comprised pre-established documents to accommodate students' input in the form of 'Agree' and 'Disagree' Arguments. Students were required to generate these, based on a specific exercise that had been set. Students were also expected to make inputs into 'Issues', 'Comments', and 'Questions' documents. The hypertext feature of FORUM was intended to allow students to make linkages between any or all of the latter three documents, and /or between the contents of these documents and the 'Agree' and 'Disagree' documents respectively.

Analysing learning through computer-conferencing

While Klemm and Snell focus on prescribing approaches for structuring computer conferencing, Henri (1992) seeks to develop a tool that can be used to facilitate analysis of the teaching-learning processes that occur within the conferencing environment. Based on his own review of the literature, he contends that current knowledge on learning in a CMC environment does not adequately address the

pedagogical characteristics of the content of conferences. Thus he makes a case for the development of "an appropriate analytical method that would identify the learning processes and strategies selected or developed by learners" (p.121). Drawing on his assessment of existing research methodologies, he argues for a movement away from quantitative towards qualitative approaches to the analysis of teaching and learning through computer conferencing and he himself proposes the method of content analysis based on a qualitative approach.

In developing a research tool based on content analysis, Henri, like Cookson and Chang discussed earlier, is using a methodology that is attracting attention and is considered as being more appropriate than others for analysing teaching-learning processes in open and distance learning (Hawkridge, 1995).

Henri sets two criteria for the development of his tool. First, it would focus on the learning process as revealed through the messages of the respective participants. Secondly, it would recognise learning as 'process' rather than 'product', highlighting "what and how the learner understands, rather than what should have been understood" (p.123). Based on these two conditions, he developed the Framework for Content Analysis to provide educators with a tool for understanding the process of learning in a computer mediated conferencing environment, which would also be capable of looking "beyond the surface meaning of the exchanged messages" (p.118).

Description of Framework

The Framework comprises five dimensions, namely the participative, the social, the interactive, the cognitive and the meta-cognitive. Henri explains that the first three relate to the processes that structure the content of the conference and shape its patterns while the latter two deal respectively with strategies that students use to do a task and to manage and control the learning situation.

He defines the participative dimension as a compilation of the number of messages or statements. Participation reveals itself as a quantitative measure, in the number of times participants enter a message, the duration of the connection and the

number of statements they make that are directly related to the formal content of the lesson. Henri contends that data on participation can provide a breakdown of educator and learner messages and, in conjunction with other data, can show the relative importance of the educator in the exchanges and in the learning process.

The social dimension is revealed in statements not related to the formal content. Henri claims that the frequency of this type of data in the conference might indicate the level of learner focus on the task, or the level of social cohesiveness in the group, or the extent to which the affective is supporting the learning process.

Interactivity emerges out of phrases and expressions that show a connection to other messages, such as 'As we said earlier'. He distinguishes between explicit and implicit interactivity. The former he defines as any statement made in response to or as a commentary on a preceding statement which explicitly mentions the message or person to which it is referring. The latter is also a response statement but does not include any reference to a preceding stimulus situation. Within this dimension, he also identifies the independent statement which, though related to the subject under discussion, is neither an answer nor a commentary and does not lead to any further statements.

The cognitive dimension, according to Henri, is revealed in those elements within messages which give information about the skills that people use in understanding, reasoning, critical thinking and problem resolution. In this context, he recognises five subskills namely elementary clarification, in-depth clarification, inference, judgement, strategies. With regard to the last mentioned for example, learners are considered to be implementing a strategy if they are deciding on an action to be taken or proposing a solution. He also highlights the need to identify a complementary set of indicators related to depth of information processing as a means of evaluating whether the cognitive subskills are being performed at a surface or an in-depth level of information processing.

In relation to the meta-cognitive dimension, Henri makes a distinction between meta-cognitive knowledge and meta-cognitive skills. The former, he says, provides

factual information about the person, task and strategies involved in the conference. For example knowledge of the person is expected to indicate "all that is known or believed about the characteristics of humans as cognitive beings" (p.132). The latter refers to the learners' capability to evaluate, plan and regulate the learning situation as well as to demonstrate self-awareness in relation to a given task.

Assessment of Framework

Henri's Framework was used as the reference point for developing my own framework for analysing data in my observation study. Consequently it will be discussed in greater detail in Chapter 7.

It is worth noting though that, like Cookson and Chang's Multidimensional Audio-conferencing Classification System (MACS), Henri's Framework has as its goal the evaluation of teaching-learning processes as they occur in a conferencing environment. In this regard it gives high priority to identifying and analysing the cognitive and meta-cognitive aspects of the interaction.

While recognising similarities between the MACS and this Framework, it can be argued that the latter is less complex and more clearly articulated. The distinction between the dimensions is easily recognisable, thus making it more robust than the MACS to support and facilitate data analysis.

Another factor worth noting is that, apart from the four critical conditions of audio-conferencing that were built into the MACS, and the participative dimension of Henri's Framework that requires quantitative data on the messages entered, neither of these two tools is essentially medium-specific. One cannot underestimate the importance of this development in which the focus is on the teaching and learning whatever the context in which this activity is taking place. In this regard, one recalls the earlier comment about collaborative learning (and, by extension, much of the writing on computer mediated communication), that claims were being made about its capability to facilitate different types of learning but that these claims were not substantiated. Consequently this analytical orientation to the study of teaching and learning in a

conferencing environment is to be welcomed.

Nonetheless what is also evident is that the media-learning relationship that is the focus of the works of Clark and Kozma, as discussed in the preceding section, is not a feature of these studies of the conferencing technologies.

Summary discussion

The significance of the discussion on both audio-conferencing and computer-conferencing is that, whether overtly acknowledged or not, it draws attention to synchrony and asynchrony as important learning-related factors. The fact that these two conditions actually define the nature of the respective technologies has heightened their importance in the agenda of open and distance learning. In addition, even though the discussants reviewed do not treat these conditions as requiring analysis, the notion of time-dependent and time-independent interaction deserves closer investigation in relation to types of teaching-learning events and the learning process itself.

It is also clear that the use of the term 'media' to refer to these technologies involves some extension of the concept that defines the conventional objects such as film, television/video, radio/audio and computer. Consequently the conventional ways of thinking about a media-learning relationship would not apply. Nonetheless the notion of media as supporting learning rather than as primarily conveying information, is aptly suited as a starting point for exploring the possibilities of learner-media interaction as it pertains to learning in the conferencing environments.

Media classification based on Conversational Framework

Laurillard's (1993) media classification scheme provides the basis for the third discussion on media and learning. Laurillard developed her scheme out of her perspective of the learning process. In this regard, her approach to the study and use of media is different from that observed in most of the works reviewed in the preceding subsection on synchronous and asynchronous interaction. Except for the analytical treatment of Cookson and Chang, and Henri respectively, the point of departure for

those discussants was always the medium (technology) and its inherent (often unexplored) capability to support learning based on one or other interactive condition.

Laurillard takes a reverse route. She starts off by outlining her conception of the learning process. This conception is ultimately constituted as the Conversational Framework which the author presents as a model of an ideal teaching-learning interaction. It is this Framework that she uses to assess the capability of the respective media to support various aspects of the learning process as represented in the Framework itself. Consequently any discussion of Laurillard's approach to the study of media and learning must start with an examination of the Framework.

Overview of Conversational Framework

Laurillard sees the learning process as being analogous to a conversation between a teacher and learner. Learners perform certain functions at given stages of that conversation, and teachers, whether in person or through the respective media, perform appropriate corresponding functions to facilitate learner movement towards the stated learning goal. The functions that both teachers and learners perform in that 'conversation' are described as being *discursive*, *adaptive*, *interactive* and *reflective* respectively. These four functions, which are operationalised within the Framework, are subsequently used to assess the capability of the respective teaching media. Media are therefore viewed in terms of their capability to perform teaching functions that are discursive, adaptive, interactive and reflective and to allow learners to engage in similar functions.

The four media functions

Discursive media are those which reveal (or allow to be revealed) the teacher's conception of a topic or task goal and provide scope for learners to reveal theirs as well. Through the airing of their respective conceptions, the teacher can reflect on the student's conceptions and is better positioned to make appropriate adjustments when re-describing her (the teacher's) conception. For his part, the student is able to modify his

description in light of the teacher's re-description. Laurillard lists the various teleconferencing media as examples of discursive media.

Adaptive media comprise those which are able to adapt the continuing dialogue in order to bridge any gap that is detected between the teacher's and the learner's conceptions. In order to do this, the media, as teacher, formulate intermediary tasks based on information drawn from the 'world'. In this context, the 'world' represents a broader body of knowledge that is accessible to both teacher and student. Laurillard considers the computer-based tutorial simulation as an adaptive medium.

With regard to the interactive media, it must be noted that the term 'interactive' as used here has its origins in a computer-based setting where, according to Laurillard, it refers to "the computer's capability to be programmed to change its behaviour according to the learner's input" (p.268). Interactive media allow learners to act to achieve a task goal. The notion of the learner 'acting' also implies that something in the 'world' that is being acted on must change observably as a result of that action. There is also a requirement that the learner must receive meaningful informative feedback whether from his own action or from the teacher about the appropriateness of the action. Laurillard cites computer-based modelling as an example of interactive media.

Reflective media allow the learner time to consider feedback on his actions and to make the link to the topic goal. Within the conversation, the teacher also requires time for reflection.

Classifying the media

Laurillard's classification scheme is therefore based on these four main functions which are further subdivided into twelve sub-functions. She then rates each medium on a yes/no scale in relation to each of the twelve.

The majority of the media that she classifies do not, on their own, meet all the requirements outlined above. Only two are optimally suited, on their own, namely the tutorial simulation and intelligent tutoring systems, (though Laurillard has some reservations about the latter).

The respective media of second generation distance education which Laurillard collectively refers to as the audio-visual media do not rate very highly. Video is rated as being capable of accommodating four of the twelve sub-functions, and print, just one. Both allow for the teacher's description of her conception. Beyond that, video also allows the teacher to set the task goal and to set up the 'world' to give intrinsic feedback on the student's actions. Because of its pause feature video also allows the student time to reflect on his interaction in order to modify his description.

Thus, based on the scheme, print is classified as being only partially discursive: it allows for the teacher's description of her conception but not the student's. Video is also only partially discursive but in addition, it can also accommodate a limited number of the features of the adaptive and reflective dimensions.

In spite of her own low rating of print, video and some of the other media, Laurillard does not exclude any. Rather she recommends that attention be paid to making appropriate combinations. She maintains,

[This kind of analysis] should help to clarify where a particular medium fails to support the student, and to suggest which media it should be combined with. Stand-alone media-based packages will never be sufficient ... However the media comparison shows how to integrate a range of media in order to best exploit the strengths of each. (p.176)

Critique of classification scheme

Laurillard's approach to analysing media and learning shares some important features with that adopted by Kozma. Both theorists explore the notion of a relationship between the learner and media, and both do so on the basis of identifiable (or potentially identifiable) media and learner functions. With regard to media functions, Kozma asserts that the capability of the respective media to support learning rests on the functions of their key attributes, namely their technology, symbol systems and processing capabilities. Laurillard also recognises media attributes. However, while

Kozma identifies his as features inherent to the media themselves. Laurillard derives hers from her conception of the learning process and then applies them as appropriate to the respective media. It can be said therefore that Kozma recognises primary attributes while Laurillard is referring to secondary attributes. Nonetheless the notion of learning taking place as a result of a relationship between learner and media functions is evident in the outlook of both theorists.

In this regard, Laurillard's work represents a significant departure from other media classification schemes where the focus is not on learning taking place as a result of the media supporting the learning process, but on the capability of the respective media to transmit different types of information (e.g. Gagne, Briggs and Wager, 1992).

Critique of Framework

Given the relationship which Laurillard herself establishes between the media classification scheme and the Conversational Framework, ultimately the appropriateness of the scheme must be measured in terms of the appropriateness of the Framework itself. Laurillard specifies that the Framework is applicable for the learning of academic knowledge. By extension therefore, it is for the learning of academic knowledge that the classification scheme is intended to be used to evaluate the respective media.

In developing her conception of knowledge, Laurillard distinguishes between everyday knowledge and academic knowledge. She explains that "Everyday knowledge is located in our experience of the world [and] academic knowledge is located in our experience of our experience of the world (p.26). Consequently, she asserts that the Framework is not applicable to "learning through experience, nor to 'everyday learning', nor to those training programmes that focus on skills alone ... " (p.102).

In clarifying her perspective on academic knowledge, Laurillard contends that students must be able to go beyond acting on the world and learn to represent the world, that they must operate at the second-order level of descriptions of actions on the

world. At the same time, she cautions against underestimating the difficulty that such an undertaking presents for the student. She states,

Academic knowledge does not present itself through experience with the world. The link is more tenuous than that. Academic knowledge is related to the experience of the world it describes, but it also requires a great deal of contemplative reflection on that experience. Furthermore, the perspective described in an academic text is not a clear glass window onto the world ... The student has to do a lot of work to discern the point being made. (pp.53-54)

Given this notion of academic knowledge, Laurillard contends that through learning, students must come to apprehend the structure of the content being learnt since "meaning is given through structure", and that, "for students to interpret a complex academic discourse as having a *specific meaning*, they must be able to apprehend the implicit structure of that discourse" (p.51) (italics mine).

This notion of academic discourse having a specific meaning is reflected in the design of the Framework. The conception that the teacher holds is presented as the one that the student must ultimately come to accept since it is the teacher's conception that presents the accurate representation of the world. Thus the overall function of the Framework is to guide the student to the point where he comes to represent the world in the way the teacher does.

It can be argued that what limits the applicability of the Framework is not primarily the likelihood that the knowledge base of many areas of study may not conform to the stated attributes of academic knowledge, but that the closed, unnegotiable conception of knowledge for academic purposes that the author holds, does not adequately represent the nature of knowledge in all the disciplines in higher education and particularly, it does not reflect the knowledge of teacher education.

Nonetheless, the Framework embodies strategies that are worth emulating. In fact, rather than being a single teaching strategy, the Framework can be viewed as an embodiment of at least three strategies. There is the *phenomenographic* dimension,

where teacher and student are able to provide their own separate conceptions of the phenomena being studied, there is the *guided discovery* aspect, as the teacher adapts the dialogue in order to facilitate the student's movement towards a given goal, and there is the *reflective* dimension to allow both teacher and student to reflect on past actions in order to determine future actions. Laurillard insists that however one approaches the use of the Framework, it is necessary to complete the entire process. It is likely that there may also be benefits in isolating and building on any of these three component teaching-learning strategies of the Framework.

In the final analysis however, the appropriateness of selecting media based on this Framework taken as a whole, would depend to a significant degree on the extent to which one embraces Laurillard's conception of academic knowledge that underpins the Framework. For ultimately, it is academic knowledge (through which students are able to represent the world) that informs the nature of the relationship between the respective media and the learning process.

Conclusion

A fundamental perspective emerging from the works of some of the theorists discussed is that media in open and distance learning should be considered in terms of their capability to support learning rather than as vehicles for the transmission of content. There are four implications of this conceptual shift that warrant attention. First it opens up scope for envisaging uses of the media for a wider range of learning events. This expanded outlook is already evident in the work of some of the authors discussed. For example, Klemm and Snell's design of a computer-conferencing environment is intended to support students engaging in higher order thinking skills and in the process generating their own knowledge. Laurillard's Conversational Framework is intended to classify media according to their capabilities to perform and/or support a wide range of teaching-learning functions. It is evident therefore that a conception of media as supporters of learning entails a changed perspective in the selection and design of media for open and distance learning.

Secondly, it also provides scope for envisaging a media-learner interaction and for exploring the attributes and capabilities that both media and the learner bring to the process. Laurillard's Conversational Framework provides an important base for re-orienting thinking in this direction. At the same time, none of the discussions on the conferencing technologies are oriented to recognising or exploring such a relationship. Based on the literature reviewed, the notion of a learner-media interaction remains largely underdeveloped.

Thirdly, it has implications for the relationship between teachers and students or even more generally between teaching institutions and students, in particular in contexts where top-down relationships appear to be rigidly entrenched.

Finally, a shift from media as conveyors of information to media as supporters of learning has opened up the possibility for recognising a parallel shift in conceptions of knowledge as a factor in the learning process. This aspect will be addressed in the succeeding chapter.

CHAPTER 5

LEARNER-KNOWLEDGE INTERACTION

Introduction

As already noted in Chapter 3, a distinction is made in this study between knowledge that exists as an external phenomenon and that which exists as cognitive resources internal to an individual. Emerging out of that position, is the further assertion that the development of a learner's knowledge base is more directly influenced by his/her manipulation of internal cognitive resources rather than by any direct engagement with knowledge in the public domain, including the subject matter content. The chapter is intended therefore to project the manipulation of knowledge at this cognitive level as learner-knowledge interaction.

The chapter explores the work of theorists, including some from outside the open and distance learning community whose outlook on the relationship between learning and knowledge is consistent with the position taken above.

In this regard, the chapter examines the notion of learning as *internal* and *external conversation*, in which the individual engages with the self and with resources outside of the self; it also looks at the theory of constructivism and, as an extension of this topic, it briefly examines the role of language in a conception of learning as knowledge construction. While, as noted earlier, subject matter content is not itself the focus of study, its importance cannot be disregarded since, along with knowledge from other sources, it constitutes the external body of knowledge that teachers and learners draw on as they engage in the cognitive activity. Thus the chapter will address issues related to the nature of that external body of knowledge and specifically, the knowledge of professional education given the focus on teacher education in this study.

Finally, in light of deficiencies cited earlier regarding the treatment of power and control in the discussion on social interaction, this chapter returns to this issue for a more detailed treatment.

An interpretation

Spencer (1991), in a review of Piaget's work on cognition, explains that Piaget views the knowledge that people use, not in the behaviourist sense of a copy of reality, but in the more cognitive sense of a "unique, individual construction". In this regard, Spencer, quoting Piaget (1971), makes the point that "to know an object is to act upon it and transform it" (p.159). Kozma (1994), in setting the stage for his perspective on media influence on learning, defines learning as,

an active, constructive, cognitive and social process by which the learner strategically manages available cognitive, physical and social resources to create new knowledge by interacting with information already stored in memory".
(p.8)

In light of the above, the discussion in this chapter is informed by a perspective of learning as knowledge-building or knowledge-construction that takes place as the individual engages with his or her own cognitive resources. This activity is seen to occur both when the individual is on his or her own and when interacting with other resources, whether human or non-human, in the wider environment.

Learning as conversation

Earlier, reference was made to Holmberg's idea of an internal conversation. Several other theorists in the wider educational environment have used the 'conversation' metaphor to describe the learning process. The work of Harri-Augstein and Thomas (1991) is of special significance in this regard.

Learning conversation

Harri-Augstein and Thomas (1991) make use of this metaphor as they develop their concept of Self-Organised Learning. These writers take as their starting point the position that learning involves conversation and they state that , "We learn by conversing with ourselves, with others and with the world around us" (p.3). They

further define learning as "the conversational construction of personally significant, relevant and viable meaning" (p.6). Against this background, they propose the notion of the Learning Conversation operating at two levels:

We conceive of two separable aspects of conversational learning which appear to go on in parallel. One is the external exchange between the learner and their resource, the other is the learner's inner exchange with themselves. This is the hidden resource which feeds the outer conversation. Even when fully reconstructed, one's verbal understanding of [the hidden resource] necessarily remains incomplete. Its language is largely non-verbal and the deeper contributor to it usually takes little part in the conscious reconstruction. But it is at this deeper level that some of the more significant encounters take place and enable the learner to transmute meanings and evolve as a conversational scientist into a new phase of personal growth. (pp. 58-59)

Two factors are worth noting about the way Harri-Augstein and Thomas conceive of a learning conversation. First, while they acknowledge the existence of both an inner and outer conversation, it is the function of the inner conversation, or inner exchange, to which they accord the higher priority. They take this position based on the perspective that it is "the hidden resource which feeds the outer conversation". Further, given their assertion about the role of deeper level processes in enabling the learner to develop into a conversational scientist, it is evident that these writers conceive of learning as an operation that is essentially self-driven.

The influence of Personal Construct Theory

This self-directed view of learning that Harri-Augstein and Thomas project, reflects the influence of Kelly's Personal Construct Theory (PCT) and the writers themselves acknowledge this. Indeed their use of the term 'conversational scientist', to describe the learner (see above), is no doubt an adaptation of Kelly's 'man as scientist'. Also reflective of the influence of PCT is their reference elsewhere to a "...reservoir of meanings deep within us that determines what we can perceive, what we

remember, what we understand and what we can achieve" (p.70).

This notion of self-directedness is the core feature of Personal Construct Theory. Bannister and Mair (1968), in their review of Kelly's work, explain that, according to PCT, a person is not an object that is impelled into action, but rather "a form of motion with the direction of the motion controlled by the ways in which events are anticipated". By way of further explanation, they state that "the ways in which a person anticipates events are defined by his personal constructs". They then define a construct as a way in which some things are interpreted as being alike and at the same time different from other things. Thus, using Kelly's own words, they assert,

We cannot say that constructs are essences distilled by the mind out of available reality. They are imposed *upon* events, not abstracted *from* them. There is only one place they come from, that is from the person who is to use them. He devises them ... A construct is the basic contrast between two groups. When it is imposed, it serves both to distinguish between its elements and to group them. The construct refers to the nature of the distinction one attempts to make between events. (p.16)

It is through this theory that Kelly affirms his belief in man-as-scientist who "comes to know the world by means of the constructions he places upon it" and who is only "bound by events to the extent that his ingenuity limits his possibilities for re-constructing these events" (Bannister and Mair, 1968, p.6).

Harri-Augstein and Thomas are not the only theorists whose view of learning reflects the influence of Personal Construct Theory. Candy (1991) also draws on it in his conception of constructivism which underlies his thinking about self-directed learning. Candy queries notions of teaching that imply that there is an objective reality to which learners should be introduced. He hastens to add though that he is not denying the existence of an outside reality; rather what he is proposing is that that reality can never be directly known. He contends therefore that "... knowledge is neither a copy nor a mirror of reality, but the forms and content of knowledge are constructed by the

one who experiences it" (p.263). Extending on this issue, he acknowledges that it is likely that different individuals, using different systems of personal constructs, may interpret or construe the same reality in different ways. In the light of this assumption, he provides this explanation of constructivism:

Constructivism in education is concerned with two things: how learners *construe* (or interpret) events and ideas, and how they *construct* (build or assemble) structures of meaning. The constant dialectical interplay between construing and constructing is at the heart of a constructivist approach to education, whether it be listening to a lecture, undertaking a laboratory session, attending a workshop, reading a text or engaging in any other learning activity. (p.272)

In building their respective conceptions of learning out of the principles of PCT, Harri-Augstein and Thomas, as well as Candy, are projecting a view of the learner as a self-propelling agent. Their perspective, like PCT itself, represents a movement away from behaviourist views of learning. According to Bannister and Mair, PCT rejects the perspective that the behaviour of an individual is determined either by stimuli that account for the direction of a person's movement, or by needs or motives which carry their own directional signal within them. Rather, they assert that the theory is based on the assumption that the human being is self-propelling and "moves in the direction of increased *meaning* in his own individual terms" (Bannister and Mair, 1968, p.11).

Critique of Personal Construct Theory

While other theorists may also reject the behaviourist perspective, they do not necessarily endorse PCT's focus on the individual as the sole agent of his or her learning. Procter and Parry (1977), while accepting the basic tenets of PCT, are concerned about the theory's lack of consideration of social processes in the individual's coming to know the world. They express the view that "psychology as a whole, because it makes the *individual* the focus of convenience, ignores the vital role of social processes". With regard to PCT in particular, they contend that as it stands

"[it] is still in danger of oversimplifying the effect of social factors on development" and they highlight the need to examine in more detail "how society influences the course of construct system development". They suggest that this influence happens in two ways:

Firstly [society] provides people with their validational experience, directly affecting the implications of their elaborative choices. Secondly a construct system is developed which reflects the ideology, constraining a person to act in a *relatively* limited set of possible ways (p. 162).

However they hasten to add that sociologists may be going to the other extreme in viewing the individual merely as a passive occupant of socially determined roles and that they themselves were not underestimating the creative potential of the individual human being.

It can be said that Procter and Parry's acknowledgement of this tension between the constraint of social forces and personal agency provides a necessary counterbalance to the strong focus on the learner as a self-propelling agent that is particularly evident in Harri-Augstein and Thomas' conception of the Learning Conversation.

The tension between the social and the personal in construct development, as discussed by Procter and Parry, parallels Moore's notion of transactional distance which, as noted earlier, involves the interplay between dialogue, as controlled by the learner, and structure, as implemented by the teaching institution.

Like transactional distance, this tension can be regarded as drawing attention to the broader issue of power and control. What is interesting about Procter and Parry's perspective is that the writers seem to be locating the issue of control not simply at the level of social intercourse, but even more so at the level of the psychological. It can be argued that, by suggesting that social factors can impact on construct development, these writers are challenging Harri-Augstein and Thomas' notion of the 'hidden resource' functioning completely under the control of the individual learner.

Summary discussion

Harri-Augstein and Thomas' *Learning Conversation* introduces an added dimension to the knowledge-building activity that was not highlighted in my earlier treatment of learner-knowledge interaction. Their perspective involves learners engaging with resources both at an internal and an external level. My own conception of learner-knowledge interaction, emerging as it does from my re-interpretation of Bates' interaction as an individual isolated activity, focuses on what Harri-Augstein and Thomas refer to as the 'inner conversation'. The issue of whether or not cognitive activity can also be interpreted as a phenomenon that extends beyond the self, will be addressed in the succeeding section. However, it is important to note that for Harri-Augstein and Thomas, it is the inner conversation that is important. It is the inner conversation that drives the 'outer conversation'.

In this regard, Procter and Parry's focus on the social, highlights a likely deficiency in Harri-Augstein and Thomas' very marked self-directed perspective on learning. Procter and Parry's position regarding the impact of broader environmental factors on learning, cannot be ignored.

Finally, the issue of power and control as it emerges in Procter and Parry's examination of the tension between social forces and personal agency in construct development is also worth noting. As noted earlier, the significance of this discussion is that it highlights control not only as a function of social, interpersonal relationships, but also as a factor impacting at the level of internal psychological processes.

Constructivism

Through their focus on meaning-generation, the above theorists share common ground with others who may be considered as being among the principal proponents of constructivism within the field of education.

Analysing the concept

In introducing their discussion of constructivism, Duffy and Jonassen (1991) consider it appropriate to make a distinction between objectivist and constructivist conceptions of the world. They state that, according to the objectivist tradition "the world is completely and correctly structured in terms of entities, properties and relations", and that experience plays no part in that structuring. They assert further that, for the objectivist, meaning exists in the world independently of the experiences which people have. The goal of understanding, according to the objectivists, is to know "the entities, attributes and relations that exist". In the objectivist tradition therefore, "the goal is to strive for complete and correct understanding" (pp. 8-9).

By contrast, the writers maintain that while constructivism acknowledges that there is a real world that we experience, meaning does not exist in the world but rather is imposed on it by people. Consequently, based on the constructivist way of thinking, there are many ways to structure the world and many meanings to be derived from any event or concept.

Duffy and Jonassen's notion of a constructivist world view is reflected in the philosophical framework which Savery and Duffy (1995) propose. The latter two writers build their framework on three propositions.

First, they assert that understanding is in our interaction with the environment, that what is learned cannot be considered separately from how it is learned. They go further to state that understanding is a function of the content, context, activity and the goals of the learner. Consequently they see understanding as an individual construction. People, they say, cannot share understandings, but can test the extent to which their

individual understandings are compatible.

Secondly they propose that cognitive conflict or 'puzzlement' is the stimulus for learning and that it is this puzzlement that determines the organisation and nature of what is learned. They explain that the goal that a learner has, not only serves as a stimulus for learning but also determines what the learner attends to. They equate the goal with a situation of puzzlement which, it is presumed, the learner has a need to unravel.

Thirdly, they take the position that knowledge evolves through social negotiation and through the evaluation of the viability of individual understandings. In this regard they see social interaction as being critical to individual understanding as well as to the development of propositions that are publicly recognised. Thus they assert, "Our social environment is primary in providing alternative views and additional information against which we can test the viability of our understanding and in building the set of propositions (knowledge) compatible with those understandings" (p.32).

Wilson, Teslow and Osman-Jouchoux (1995) translate the philosophical into the practical and provide a definition applicable to teaching-learning situations. Drawing on the earlier work of Merrill (1991), they propose a definition that embodies a series of propositions, including the following:

1. Knowledge is constructed from experience.
2. Learning is a personal interpretation of the world.
3. Learning is collaborative, with meaning negotiated from multiple perspectives.
4. Learning should be situated in realistic settings.
5. Testing should be integrated with the task and not be a separate activity.
6. Learners should participate in establishing goals, tasks and methods of instruction and assessment. (p.141)

Wilson et al. (1995) also recognise a philosophical base for their definition. Specifically they contend that constructivism has its roots in postmodernism which emphasises in part that knowledge is constructed by people, that there are multiperspectives to reality, that truth is grounded in everyday life and that science and all other human activities are value-laden.

The concept in practice

Constructivism as described above is operationalised in two key areas of practice, namely instructional design and the design of learning environments.

Instructional design

Lebow (1995), in addressing the need to transform instructional design (ID), makes the point that most conventional ID models function as closed rather than open systems. He explains that while closed systems are open to information, they do not exchange matter with the environment. On the other hand, a core feature of open systems is that they maintain a continuous input-output relationship with their environment. Lebow sees the open systems approach to instructional design as providing the appropriate context for the introduction of constructivist principles into this area of practice.

Lebow takes as his starting position that constructivism is a philosophy rather than a method. Hence he draws on the philosophy in order to generate five principles to inform the practice of ID. For example he recommends that instructional designers should maintain a buffer between the learner and what he refers to as the potentially damaging effects of instructional practices. In this regard, he draws attention to the prevailing tendency to ignore the affective dimension of learning since such objectives are difficult to operationalise in a closed system model. He therefore recommends a movement towards "holistic approaches to education that see the process of acquiring new knowledge and understanding as firmly embedded in the social and emotional context in which learning takes place" (p.178).

Lebow's fifth principle calls for a strengthening of "the learner's tendency to engage in intentional learning processes, especially by encouraging the strategic exploration of errors". He argues against a negative perception of errors and seeks instead to foster an approach that helps students "to make their knowledge construction activities overt" (pp. 183-184).

Savery and Duffy, cited earlier, also contribute to the pool of instructional principles. Their eight principles include the following:

1. Anchor all learning activities to a larger task or problem.
2. Support the learner in developing ownership for the overall problem or task.
3. Design the learning environment to support and challenge the learner's thinking.
4. Provide opportunity for and support reflection on both the content learned and the learning process.

Implications

What is emerging from all of the above principles and prescriptions is that, unlike conventional instructional design (ID) practitioners, those who subscribe to a constructivist philosophy place greater emphasis on the development of the learner than on the acquisition of a pre-determined body of knowledge. In that context, two other factors need to be recognised.

First, while it may be premature to talk about constructivist instructional design principles in terms of a model, to the extent that there is a model emerging, it can be regarded as sharing a core feature with traditional ID in that the model is prescriptive: designers are provided with guidelines and procedures that they are expected to follow. Nonetheless an important point of departure is that it is prescriptive at a broader rather than a narrower level. Consequently it provides scope for the interpretation of the instructional designer during implementation. Of interest in this regard is the comment made by Wilson et al. (1995) that

the constructivist environment has helped to validate a more open-systems view of instruction that is less defined by prespecified objectives and more open to the initiative of students and teachers. The result is instruction that depends more on context-sensitive decisions and resources. (p.26)

Secondly, more often than not, its procedures would result in the design of a learning environment (including materials) that is only partially formalised and which will shape and re-shape itself during the implementation process.

The design principles outlined above are therefore intended to support learners who must take greater responsibility for what and how they learn, and who must play an active part in manipulating and evaluating the knowledge that would ultimately form part of their individual and collective knowledge base.

Learning environments

Jonassen and colleagues pay a lot of attention to the conceptualisation and design of the learning environment which they regard as an essential adjunct to their treatment of learning from a constructivist perspective. By way of definition, Wilson et al. (1995) conceive of a learning environment as,

a place where learners may work together and support each other as they use a variety of tools and information resources in their pursuit of learning goals and problem-solving activities. (p.27)

Jonassen and colleagues do not define the concept in terms of a place but rather as a condition that is constituted from certain key elements and that is experienced by the learner. Thus they affirm,

Constructivist environments engage learners in knowledge construction through collaborative activities that embed learning in a meaningful context and through reflection on what has been learned through conversation with other learners. (Jonassen, Davidson, Collins, Campbell and Haag, 1995, p.13)

The four key elements in this definition are context, construction, collaboration and conversation. The authors later define context as "features of the real world setting in which the task to be learned might naturally be accomplished" (p.13), and emphasise the dynamic relationship among all four elements.

Another set of ideas feeding into the concept of the learning environment is the four-point model of meaning-making which comprises the functions of articulation, social negotiation, internal negotiation and reflection. Of internal and social negotiation Jonassen and colleagues explain,

We debate, wrestle and argue with ourselves over what is correct, and then we negotiate with each other over the correct meaning of ideas or events. (p.12)

Then based on the four-point model, they affirm

Learning ... can best be facilitated through the design and implementation of constructivist tools and learning environments that foster personal meaning-making and discourse among communities of learners. (pp. 12-13)

Role of mental models

Within this collaborative, constructivist environment, Jonassen and his colleagues also draw attention to the role of the individual and specifically to the part played by the individual's mental models. They state that learners use mental models to explain, predict and infer, as well as to reflect on the utility of the models themselves (Jonassen, Campbell and Davidson, 1994, p.37). Elsewhere, Jonassen himself provides an extension on this basic explanation when he claims,

Behaviour is not the real issue, but rather mental models are. Learners construct mental models of the world in order to help them comprehend it and predict the effects of their actions on it. ... Objectivists believe that they can control mental model development, where radical constructivists believe that construction is inherently individualistic and idiosyncratic. They are both to varying degrees correct ... It is possible to influence mental model development. Yet mental

models will always be to some degree individualistic. (Jonassen, October, 1995)

To support the development of these mental models and by extension knowledge construction itself, Jonassen and colleagues advocate the adoption and use of cognitive tools (or mindtools) which they describe as "mental and computational devices that support, guide and extend the thinking processes of their users". They also describe them as general-purpose thinking tools that can be used individually or in groups to facilitate knowledge representation and construction. Examples of such tools are databases, spreadsheets and semantic networks (Jonassen et al., 1995, pp. 20-21).

Critique of constructivism

As is evident in the preceding discussion, a primary feature of constructivism is its view of knowledge as being largely context-specific. For Jonassen, context is one of the key elements of the constructivist learning environment, and learning within that environment is based on knowledge that is generated from and meaningful to the 'community of learners' participating in the exercise. As noted earlier, context itself is described as "features of the real-world setting in which the task to be learned might naturally be accomplished" (Jonassen et al, 1995, p.13). Indeed, in suggesting situations in which the constructivist learning environment could be applicable, the authors refer to a "community of practitioners helping to solve real-world problems" (p.12). In this regard, the authors are drawing on perspectives consistent with the concept of situated cognition (Brown, Collins and Duguid, 1989).

In addition, reference was made to the contribution of Wilson et al. (1995) who, drawing on the tenets of postmodernism, explain that according to the constructivist perspective, knowledge is constructed from experience and that learning is a personal interpretation of the world.

There are those in the field who oppose this relativist perspective of knowledge. Gruender (1996) is particularly concerned about the low status constructivists accord to knowledge that is the product of past generations, which has been accumulated and

recorded. He sets out his argument in this way:

Sometimes constructivists go so far as to insist that, as knowledge consists solely of the ideas individual people have arrived at and now possess mentally, it certainly does not exist in books or other materials". (p.21)

His response to that is,

One of the purposes of schooling and education in general, is precisely to help students to see this previously acquired knowledge as something live and important to them. A contempt for books and for the work of those now dead, were it to become widespread, would defeat this vital function of civilisation. (p.22)

He contends further,

Another important function of education is to challenge us to take what previous generations have thought was knowledge and ask ourselves whether it stands up to rigorous examination and testing in the experience of our own times. Sometimes we find that it does, in which case we have gained an even deeper understanding of it and its relevance to our lives. And sometimes we find it does not. It may have been applicable in earlier times ... Or perhaps earlier inquirers were misled by merely surface features of a phenomenon, or misinterpreted crucial facts, or did not have the ability to reach the range of facts now available to us. Clearly such thinking is 'constructive' in the best sense of the word, but it requires previous content provided by others, along with critical rationality. (p.22)

Gruender's perspective on knowledge in the formal education context is certainly very pertinent. While not ignoring the likely validity of the perspective that social institutions use their authority to present long-established knowledge claims as dogma, one needs to be wary of a perspective which, however unwittingly, may be undermining students' recognition of the role and value of knowledge in the public

domain and of their relation to it. Gruender's position allows for an approach to teaching and learning that accommodates a critical awareness of existing knowledge while simultaneously providing scope for the creative input of students.

Power and control

Another aspect of constructivism that deserves attention is its view that learning, or more specifically knowledge construction is a shared activity. Wilson et al.(1995) contend that learning is collaborative, and Jonassen et al.(1994, 1995) see learning as involving both social and internal negotiation.

It can be argued that, inherent to this notion of learning as social and internal negotiation, is the element of power. Specifically, the recognition of a negotiating function in the learning process implies a situation where individuals are taking and yielding control as they seek to assert or accept alternative conceptions. Even where the negotiation is completely intrapersonal, the same situation applies. The internal debating and wrestling to which Jonassen himself alludes, of necessity involves its own power struggle between competing conceptions. The fact that this issue of power and control is not addressed in the treatment of constructivism, can be regarded as a gap at the level of conceptualisation.

Learning as knowledge construction

Probably the key contribution that constructivism has made to the understanding of learning is that whatever the situation in which learning is taking place, learners construct rather than acquire knowledge and that the purpose of this construction is to derive meaning. In this meaning-making function, the learner draws on existing knowledge to support the building of new knowledge. A view of learning as knowledge construction is of particular importance for distance learners whether seen as studying largely in isolation or in the interactive environment made possible by the new technologies. In either context, such learners must take active responsibility for what and how they learn.

There are similarities between this constructivist view of learning and my own notion of learner-knowledge interaction in which I see learners engaging with their own cognitive resources for the purpose of adjusting and/or enhancing their individual knowledge bases.

Greater bias towards the social

While Jonassen and colleagues seek to strike a balance between the intrapersonal and the interpersonal dimensions of learning, there are those who focus almost exclusively on the collaborative aspect with little or no reference to individual role in that context. This bias towards learning as an activity that is predominantly social in nature, is overtly acknowledged by some theorists. It can be argued that Bruner's perspective on the role of culture in human psychology has influenced this orientation towards the social. Specifically Bruner argues against the individual-centred information-processing paradigm and proposes instead a perspective that recognises culture as a central concept in psychology. He contends,

[It is] impossible to construct a human psychology on the basis of the individual alone ... To treat the world as an indifferent flow of information to be processed by individuals each on his or her own terms, is to lose sight of how individuals are formed and how they function ... Given that psychology is so immersed in culture, it must be organised around those meaning-making and meaning-using processes that connect man to culture. (Bruner, 1990, p.12)

Mercer (1995) no doubt shares this line of thinking. He asserts,

The essence of human knowledge and understanding is that it *is* shared ... This is the essence of what I called the *socio-cultural approach* to the study of the development of knowledge and understanding ... It gives explicit recognition to how people construct together. This inevitably highlights the role of language in the construction of knowledge. (pp. 66-67)

In addition, one recalls the position of the proponents of collaborative learning, some of whom advocate this approach to learning on the grounds that it facilitates the co-construction of knowledge (e.g. Gunawardena, 1991).

It would appear therefore that those who advocate a social dimension to constructivism can be regarded as occupying different points along a continuum. Jonassen and colleagues see learning as involving social negotiation, but they accord equal emphasis to internal negotiation. Mercer and some of the noted advocates of collaborative learning project a clear focus on the social with little or no acknowledgement of functions specific to the individual. It is worth recalling at this point that, in complete contrast to the above, there is the strong individual-centred orientation of the adherents of Personal Construct Theory who, as noted earlier, regard learning as being essentially self-propelling. It is evident that any attempt to project a view of interaction as an internal cognitive activity, must take into consideration these differing conceptions.

Language in knowledge construction

It is inevitable that a conception of knowledge-building as a shared activity would entail a focus on language as the vehicle supporting that activity. Indeed, Mercer clearly states this in outlining his position about the socio-cultural approach. While Maybin (1994) does not directly address learning in a formal sense, her conception of the 'dialogic construction of the speaking subject', also recognises language as a key factor in people's knowledge-building activity.

In her examination of the informal conversations of ten to twelve year old children, she looks at the way they incorporate reported speech into their utterances and consequently how they take on the voices of the individuals being reported on, as well as voices from previous social and historical contexts. In exploring the issue she makes the point that "an utterance is always in some sense a response, whether to a voice within the current conversation, voices from previous conversations or from reading of texts, or a voice in an inner conversation" (p.2). It is important to note that Maybin does

not restrict the findings of her study to children. In her conclusion, she generalises in this way,

Although I have focused on children, I would suggest that this kind of language use is not just maturational ... but is actually an inherent part of all language use; in many ways we continue this negotiation of our speaking voices and subjectivity throughout our lives, and we draw on and reconstruct other voices from our increasingly extensive experience of dialogue to do so (p.9).

What is significant about Maybin's study, is that while her starting point is the external conversation, her ultimate focus of interest is how that external conversation impacts on internal processes from which the utterances of the speaking subject are generated. Essentially Maybin is recognising an interrelationship between the interpersonal and intrapersonal dimensions of cognitive activity, with the direction of the relationship proceeding from the interpersonal to the intrapersonal.

Thus, while at one level Maybin's notion of the 'dialogic construction of the speaking subject' indicates a leaning towards the perspective of learning as a shared, social activity, at another level, she is also paying attention to the way this external activity impacts on the internal processes. In this regard, her perspective differs significantly from that advanced by Mercer who, while recognising the language function, restricts his notion of it to how it is used at the shared, interpersonal level.

While distance learners may not find themselves in constant direct contact with other individuals in the same way as Maybin's subjects did, one cannot ignore the influence that other 'voices', from other places and other times, can have on the 'utterances' of distance learners even when in physical isolation.

Assimilated discourse

Maybin finds support for the findings of her study in the work of Mikhail Bakhtin who, writing in relation to discourse in the novel, expresses the view that "every conversation is full of transmissions and interpretations of other people's words" (p.338). To reinforce this point he adds, "In the everyday speech of any person

living in society, no less than half (on the average) of all the words uttered by him will be someone else's words (consciously someone else's) transmitted with varying degrees of precision and impartiality" (p.339). Bakhtin refers to this phenomenon as assimilated discourse.

However Bakhtin's treatment of the issue goes beyond the level of comparing what is assimilated with what is transmitted. Using language use in the formal learning environment of the school to illustrate his point, he contends that there is a deeper ideological significance to everyday speech.

Authority in assimilated discourse

At this deeper level, Bakhtin asserts that it is not simply a case of the individual assimilating information, directions and rules. Rather the assimilated discourse is seen as influencing the speaking subjects' outlook on the world and approach to dealing with it.. When the discourse is performing this type of function, Bakhtin affirms that it can be either of two types, namely *authoritative discourse* or *internally persuasive discourse*. While recognising that both can occur simultaneously in a single word, he admits that more often than not, this is not the case, and that in the development of an individual's ideological awareness, there is frequently a gap between the two.

Regarding authoritative discourse, Bakhtin explains,

[It] demands that we acknowledge it, that we make it our own; it binds us, quite independent of any power it might have to persuade us internally; we encounter it with its authority already fused to it ... It is not a free appropriation and assimilation of the word itself that authoritative discourse seeks to elicit from us; rather, it demands our unconditional allegiance ... It enters our verbal consciousness as a compact and indivisible mass; one must either totally affirm it, or totally reject it. (pp. 342-343)

In contrast, he says of internally persuasive discourse,

As opposed to one that is externally authoritative, [it] is, as it is affirmed through assimilation, tightly interwoven with 'one's own word'. In the everyday rounds of our consciousness, the internally persuasive word is half-ours and half-someone else's. Its creativity and productiveness consist precisely in the fact that such a word awakens new and independent words, that it organises masses of our words from within, and does not remain in an isolated and static condition ... It enters into an intense interaction, a *struggle* with other internally persuasive discourses. (pp. 345-346)

Critique

Bakhtin's thesis about these two types of assimilated discourse bears some resemblance to Procter and Parry's proposition regarding the relationship between the constraints of societal factors and the self-propelling tendencies of one's personal construct in the psychological make-up of the individual.

What Bakhtin shares with the first two writers is an awareness of the tension that arises between opposing centres of power as they impact on the consciousness of the individual. There is a difference though in that Bakhtin specifically focuses on internal verbal processes, and through these, on the contrast between the two different types of discourses described above, as they respectively seek to assert control on the 'word' of the individual.

Bakhtin's assimilated discourse can be regarded as introducing a necessary power-related dimension that has relevance in the context of learning from a constructivist perspective. His thesis seems to imply that the extent to which the notion of social and internal negotiation can succeed, would depend on the individual learner's capability to build knowledge in a manner that is more likely to generate internally persuasive rather than authoritative discourse.

Summary discussion

Emerging out of the preceding discussion is an apparent divergence in perspectives regarding the weight given to the intrapersonal and interpersonal conceptions of the learning process. Gunawardena and Mercer show a clear bias towards the interpersonal, as they project a view of learning almost exclusively as the co-construction of knowledge. Jonassen and colleagues do not appear to see the need to emphasise the interpersonal above the intrapersonal or vice versa. Maybin and Bakhtin, who introduce the language factor, highlight an internal as well as an external language function in the construction of knowledge. In the preceding section of this chapter, the discussion focused on Harri-Augstein and Thomas who were highlighted as giving precedent to the inner conversation, and, in the process, displaying a clear bias towards an individual-centred conception of the learning process.

In the introduction to this chapter, it was noted that, in the context of this study, learner-knowledge interaction was being interpreted as the manipulation of knowledge at an internal level. In the earlier discussion on the limitations of Bates' two contexts for interaction and Moore's three types of interaction, a shift from the label 'learner-content interaction' to 'learner-knowledge interaction' was justified on the grounds that, embedded in the latter, was a recognition that it is the internal cognitive activity that carries the responsibility for bringing about change in the individual's knowledge base.

Subsequently, in the context of this discussion on constructivism, I noted my own agreement with the constructivists' perspective of learning as knowledge construction and meaning making, but disagreed with the proposition that learning is a shared cognitive activity. Instead I have maintained my initial position that knowledge construction is an internal cognitive activity, whether the individual is learning in isolation or in a group setting.

While much learning actually takes place in group settings, it is being argued here that the social context is not a necessary condition for it to take place. Individuals do not necessarily need to be part of a collaborative group process to be able to activate

and make use of their cognitive resources. Moreover, it is often the case that in a group setting, it is the contribution of the individual that propels the group forward. At the same time, one cannot deny the role of social and other environmental factors in influencing cognitive activity. However, what this situation means is that, given the fact that learning often takes place in group settings, there is an important interrelationship between learner-knowledge interaction and social interaction that must be recognised. Recognising this interrelationship is even more pertinent in the context of the new telecommunications and computer-networked technologies which are making it possible for learning to take place in social settings, notwithstanding the physical separation among participants.

Partial support for my perspective of the separation, yet interrelatedness, between learner-knowledge interaction and social interaction, is found in that aspect of Kaye's (1992) proposition, cited earlier. Kaye states, in part, that "learning is inherently an individual, not a collective process, which is influenced by a variety of external factors, including group and interpersonal interactions" (p.4). A focus on this aspect was deliberately intended to exclude Kaye's ultimate position that learning "is simultaneously a private and a social phenomenon" (4). The first part of Kaye's proposition strongly reflects my own conception of learner-knowledge interaction and its relationship with social interaction.

Bakhtin's assessment of assimilated discourse and the corresponding gap in the conceptualisation of constructivism highlight the need to re-focus attention on the effect of power relations which up to this point of the review has been only partially addressed. In addition, in light of Gruender's concern about the low status that constructivists accord to knowledge from external sources, there is need to explore knowledge in the public domain as well. Both will be addressed in the succeeding sections of this chapter.

Knowledge in professional education

In chapter 3, it was noted that Moore's 'learner-content interaction' was being replaced by the label 'learner-knowledge interaction' to focus attention on knowledge as a facet of the learner's cognitive processes rather than as an external product whether derived from the formal subject matter content or from other sources. At the same time it was acknowledged that the external knowledge environment was nonetheless important since it feeds into and is itself redefined by the cognitive activity of the participants in the teaching-learning situation. Consequently there is need to examine the nature of this external entity. This examination will be confined to knowledge in the context of professional education since teacher education is the focus of study in this thesis.

The issue of what constitutes knowledge in professional education has always been a source of debate. The distinction that is frequently made between theory and practice, more often than not, masks an uneasy relationship between different types of knowledge with one or other type being more valued than another. Thus the ensuing discussion is based on the understanding that knowledge in professional education is a multi-faceted phenomenon, that its different dimensions need to be identified and that some attempt should be made to determine the relationship among them.

Types of knowledge

As a result of his concern for the perceived low priority that higher education accords to knowledge associated with the provision of people-based services, Eraut (1992) proposes his own classification of knowledge for professional education. He distinguishes between two broad types, namely propositional and process knowledge.

Propositional knowledge

With regard to the first, he further sub-divides it into three sub-categories, namely.

1. Discipline-based theories and concepts, derived from bodies of coherent systematic knowledge.
2. Generalisations and practical principles in the applied field of professional action.
3. Specific propositions about particular cases, decisions and actions. (Eraut, 1992, p.101)

Eraut's main concern about the first of these three subcategories is that it is not normally perceived as being relevant at the level of practice. He observes,

The process of becoming a professional involves learning to handle cases quickly and efficiently and this may be accomplished by reducing the range of possible ways of thinking about them to manageable proportions. This leads to intuitive reliance on certain communal practitioners' concepts, while apparently more valid theoretical ideas get consigned to 'storage' and never get retrieved. (Eraut, 1985, p.120)

Eraut is concerned about what he perceives as a rejection of discipline-based theories. With regard to generalisations and practical principles, the second subcategory, he raises questions about their validity. Specifically he has misgivings about the way practical principles are transformed into generalisations.

He explains that in some instances generalisations may be formed when an idea, procedure or action used in one situation is considered applicable in another. Alternatively, they may emerge from other people's experiences and may be passed on through informal contacts or through the literature. Whatever the context, Eraut is not convinced that there is enough rigour in the generalisation process. Thus he argues for a systematic analysis of the transformation process with a view to making it "more explicit so that it can be criticised and refined". He is also recommending that close attention should be given "to specifying the conditions under which any given practical principle or generalisation was held to apply" (Eraut, 1985, p.121).

He makes a connection between specific propositions as identified in the third subcategory, and personal knowledge. He says that not all propositional knowledge is public and that personal knowledge also contains propositions. By way of explanation, he states that at a non-formal level people derive knowledge from everyday experiences, social interaction and from "trying to get things done". While he acknowledges that much of this knowledge remains at the level of simple impressions, he contends that some is sufficiently processed to be ascribed the label, propositional or process knowledge (1992, p.102).

Process knowledge

With regard to the second main type, process knowledge, he asserts that it, "can be defined as knowing how to conduct the various processes that contribute to professional action". He states further that it includes "knowing how to access and make good use of propositional knowledge" (p.105). He identifies five kinds of process, namely acquiring information, skilled behaviour, deliberative processes, giving information and controlling one's own behaviour. The distinction that Eraut makes between skilled behaviour and deliberative processes is worth noting.

He describes skilled behaviour as a "complex sequence of actions which has become so routinized through practice and experience that it is performed almost automatically". Referring specifically to the teaching profession, he makes the point that much of what a teacher does is skilled behaviour and that ultimately, knowledge of how to teach becomes tacit knowledge that teachers themselves cannot explain easily, not even to themselves (p.109).

As the name suggests deliberative processes involve very conscious and deliberate acts which include planning, problem-solving, analysing, evaluating and decision-making. Eraut notes that the performance of these acts requires combinations of propositional knowledge, situational knowledge and professional judgement. He claims further that practitioners need to have knowledge of the specific context or situation as well as knowledge of possible courses of action and decision options that

could be used in the given situation. Focusing specifically on processes like problem-solving and decision-making, he suggests that they require a moving back and forth between interpretations of the situation and possible actions; and continuing in this iterative process until, based on one's professional judgement, one is satisfied that the best possible course of action has been reached. Eraut emphasises that the process is cognitive rather than intuitive and requires a combination of divergent and convergent thinking.

In summary therefore, Eraut classifies the knowledge base of professional education into two broad categories, namely propositional and process knowledge, each with its own sub-categories.

Theory and practice

Ellis' (1992) treatment of the topic closely parallels that of Eraut. He develops his analysis within the framework of the widely used terminology of theory and practice and seeks to underscore the close relationship between the two with the assertion that "thought and speculation should affect action and vice versa" (p.70). He specifies three levels of theory, namely personal, professional and academic. Of interest is the status which he accords to personal theory. He contends that people in their everyday lives engage in the act of theorising and he states further,

It is a reasonable assumption that all human beings not only behave and may be observed doing so, but also that they consciously reflect on their behaviour: that is, they theorise about what they might do, what they are doing, and what they have done. (p.70)

Assessment of classification

There are two factors worth noting about the treatment of knowledge by these two writers and in particular Eraut. First, Eraut's classification does not only deal with knowledge in the public domain. It also includes knowledge that is manipulated at an internal, cognitive level. His category of process knowledge allows for the recognition

of knowledge that is not necessarily articulated and externalised. It is largely knowledge that supports and facilitates the incorporation, generation or manipulation of other knowledge types that can be recognised as being part of the external environment.

One also detects an intention to recognise knowledge that exists at a level that is more personal to the practitioner and to accord it a status comparable to that automatically granted to the long-established forms already existing in the public domain of the academic and professional communities. For example, by using the same term 'proposition' to refer to types of knowledge in both the public and private (personal) domain, Eraut is investing the less official type with qualities that he also recognises in the official, discipline-based theories and concepts. Ellis' notion of personal theory can be regarded as serving the same purpose of elevating the personal to the level of the academic and the professional.

Eraut's intention to raise the status of personal knowledge is accompanied by a concern that this area of knowledge should be subjected to the rigorous examination that is consistent with the ideals of the objectivist tradition. Consequently, in order to allay fears regarding the validity of generalisations and practical principles, he is requiring greater transparency in the processes through which practical knowledge is transformed into generalisations.

The classification exercise that both writers undertake can be regarded as an attempt to build bridges across all forms of professional knowledge and to incorporate all within the same epistemological boundaries.

Experiential learning

Alongside the orientation described above, there are emerging other conceptions of knowledge which can be regarded as indicators of an important paradigm shift in further and higher education (FHE). Henry (1993) points to this shift when she asserts,

The move from a passive to a more participatory approach in education is one aspect of a fundamental paradigm shift that is being played out in all disciplines. The world view is changing from a perspective concerned with analysis,

separation and control which has over-emphasised the virtues of intellect at the expense of affect and experience. We are moving towards a more relational world view that draws attention back to the role of apprehension, perception and co-operation.(p.8)

Advocates of experiential learning are key actors in this movement towards a new epistemology. An important feature of their view of learning is the emphasis they place on reflection. Boud and Walker (1993) refocus attention on three factors pertaining to the role of reflection in experiential learning, which they had previously discussed. They summarise the factors in this way:

The first was a return to the experience in which the learner recalled the experience in a descriptive way as it had apparently occurred, without judgement or evaluation. The second was to attend to feelings that arose out of the return to the experience ... The third factor was the re-evaluation of the experience, in which learners linked with this experience elements from their past experience (*association*), integrated this new experience with existing learning (*integration*), tested it in some way (*validation*) and made it their own (*appropriation*). (p.75)

It is evident that underpinning this view of learning is a perspective that emphasises experience as a source of knowledge.

Implementing experiential learning

Thorpe's report (1991) on the implementation of a distance education course highlights this view of knowledge. Based on her own perspective that reflection "is the means through which both concrete experience and abstract theory are transformed into knowledge which the learner 'owns' and can use in their own terms" (p.1), she describes the experience of developing and administering the module 'Approaches to Adult Learning' (AAL) which was part of the Professional Diploma in Post Compulsory Education offered by the United Kingdom Open University. She states

that the goal of the overall programme was the development of the learner as a professional or practitioner and in that context, a requirement of the AAL module was that students were "to use their own direct experience as a resource for thinking critically about the ideas and theories presented in the module" (p.7). Citing comments from the students themselves, she contends that "they welcomed rather than rejected the theory introduced in the module, which they saw as relevant to their immediate work experiences" (p.10).

Assessment of practice

It is evident that the AAL module was designed to facilitate optimum linkage between abstract theory and personal experience and to accord priority to personal experience. Hence theory was selected and used to foster students' evaluation of their own experience as well as to validate knowledge arising out of that experience. One may infer that theory which was not perceived as being capable of contributing to this experiential learning, may have been omitted. In this regard, one notes the criterion of relevance that students gave for welcoming rather than rejecting the theory. It would appear therefore that students' perception of what was relevant could have been an important criterion in determining what was learnt from the discipline-based knowledge.

Thorpe's approach to the design and implementation of the AAL module is certainly consistent with the world view that Henry (1993) advocates, as described above. However, one may argue that a professional education programme that is so heavily weighted towards learning derived from the experiences of the students, may not be paying sufficient attention to the wider societal factors which also define the role of the practitioner. Drawing on the position enunciated by Gruender (1996), and described earlier, it is likely that such an approach may deprive students of the opportunity to explore the boundaries of their respective professions and thus limit the development of an appropriate knowledge base for practice. Indeed, it can be argued that experiential learning is imposing the same restrictions on students' knowledge

growth as the context-based approach of constructivism. that Gruender was questioning.

Reflection-in-action

Schon (1983) whose influence Thorpe acknowledges in the development of her own perspective, can be regarded as a key agent in the paradigm shift in knowledge for professional education. His notion of the reflective practitioner emphasises the importance of professionals reflecting on their own practice. He rejects the Technical Rationality model of professional education which, he contends, fosters the thinking that intelligent practice involves the "application of knowledge to instrumental decisions" (p.50). He is opposed to its rigid means-ends approach which requires that ends are fixed and clear, a situation which, he insists, is rarely ever the case in practice.

It is against this background that Schon proposes the notion of reflection-in-action and highlights the importance of recognising the professional's practical knowledge which he more specifically defines as knowing-in-action. He illustrates his perspective by drawing on the work of expert jazz musicians, and explains that during a performance,

they are reflecting-in-action on the music they are collectively making and on their individual contributions to it, thinking what they are doing and, in the process, evolving their way of doing it. (p.56)

As a further illustration, he reports on a research project in which teachers on an in-service education programme were encouraged to explore their own intuitive thinking about tasks associated with the different content areas that they taught. Schon concludes,

When someone reflects-in-action, he becomes a researcher in the practice context. He is not dependent on the categories of established theory and technique, but constructs a new theory of the unique case. His inquiry is not limited to a deliberation about means which depends on a prior agreement about

ends. He does not keep means and ends separate, but defines them interactively as he frames a problematic situation. (p.68)

Assessment of reflection-in-action

Schon's perspective of knowledge in professional education has received much acclaim from theorists and practitioners in further and higher education. His views on the limitations of the Technical Rationality model, his recognition of the part played by practitioners themselves in generating and using their own knowledge in the context of practice, his commitment to the ideal of professionals as reflective practitioners have found strong support within the field (e.g. Thorpe, discussed earlier; Barnett, 1990).

It is worth noting though that both Eraut and Ellis also acknowledge the significance of the professional's own knowledge base. Eraut recognises this knowledge in the form of generalisations and specific propositions as well as in some aspects of process knowledge. For his part, Ellis emphasises the importance of personal theory, noting that people in their everyday lives engage in the act of theorising. However there is a difference between these two and Schon in terms of the amount of emphasis placed on the personal knowledge of the professional. While Eraut and Ellis recognise this type as one component of the total knowledge base, Schon's position appears to be that 'knowing-in-action' or more specifically 'knowing-in-practice' ought to be accorded a dominant position.

Being 'a researcher in the practice context', seems to imply that the practitioner pays little or no attention to 'categories of established theory and technique'. Thus it would appear that Schon is advocating that practitioners shift focus away from knowledge from external sources and rely instead on that generated from their own experience for use in their problem-solving activities. Such a perspective, appears to ignore the fact that the practitioner comes to the problem situation with a knowledge base that has been built up from various knowledge sources, including, no doubt, sources related to 'established theory'. It would appear that, in objecting to the instrumental use of theoretical knowledge, Schon is implying that there is no place for

such knowledge in the problem-solving activities of the professional.

Alarcao and Moreira (1993) hold reservations about the dichotomous relationship that Schon seems to be setting up between a reflective approach to professional practice and one that recognises and draws on various sources of knowledge to address particular needs or problem-solving situations.

As teacher educators the two writers are responsible for a course on didactics which they teach to pre-service teachers. They report that students take this course after they have completed courses in the academic and professional areas and before they enter their teaching practice. They state therefore that the course is intended to serve as a bridge between theory and practice, or as they explain further, to serve as a link between "knowledge and skill, knowing what, knowing how and knowing in which circumstances" (p.35).

The writers provide an extensive explanation of their didactics course, based on their definition of its different dimensions. For example they refer to its analytical dimension which, they claim, "confronts the prospective teacher with the task of dissecting and understanding the complexity of factors embracing the learners in their attempts to grasp and develop knowledge in a given subject". They also refer to the interface dimension that involves viewing "the same object of analysis from different angles" (p.33).

Based on limitations which they perceive in didactics to achieve the purposes outlined above, they also draw on Cognitive Flexibility theory as espoused by Spiro et al. (1987) which they state, involves,

the ability to adaptively reassemble diverse elements of knowledge to fit the particular needs of a given understanding or problem-solving situation. It has as its main goal knowledge transfer rather than reproductive memory. (p.37)

They advise further that "to develop this knowledge transfer ability rather than reproductive memory ... learning must shift from single to multiple representations and from generic schema retrieval to situation-specific knowledge assembly" (p.37).

Alarcao and Moriera are therefore advancing a view that recognises that professionals need to access knowledge from various sources. Their goal though is that their trainee teachers should develop the competence to make linkages among 'diverse elements of knowledge'. It is evident that these writers do not concur with the largely uni-dimensional perspective of knowledge to which Schon seems to subscribe.

Summary discussion

What has emerged from the above is that there are different and even conflicting paradigms governing perspectives on the nature of knowledge of professional education. There are those who highlight the multi-faceted nature of that knowledge base and seek to accord equal recognition to the various sources from which professional knowledge is derived.

Alongside the above, there are other orientations that are advocating a substantial epistemological shift, and in the process raising the status of types of knowledge currently regarded as belonging to the private domain, and also reversing the relationship between this type and the long-established knowledge of the public domain. In this shift, greater emphasis is being placed on knowledge that is socially and culturally situated. Thus experiential and context-specific knowledge are highly acclaimed, and less value is accorded to discipline-based knowledge in the broader, more public domain.

Whether one subscribes to one or other epistemological perspective, it is to be noted that professional education derives from both discipline-based and experiential knowledge and that more often than not, the relationship between the two is rarely ever adequately articulated. Further, the nature of this relationship has implications for how learners engage with and make use of their cognitive resources.

Power and control in teaching and learning

The issue of power and control has emerged in various ways and at various points in this overall discussion. It is inherent, although not clearly articulated, in Garrison and Baynton's model of learner control. Juler demonstrates an awareness of its effect, in his assessment of the dominance of 'institutional text' in relation to 'student text'. It also underpins Moore's notion of transactional distance, in which the author highlights the interplay between dialogue and structure. It gives rise to the tension between the constraint of social forces and individual freedom, as highlighted by Procter and Parry. It can be observed in the gap which Bakhtin sees as existing between authoritative and internally persuasive discourse.

It is also evident that the issue has been examined at two levels. At one level, it has been recognised as a factor of interpersonal relationships and the overall social setting of the teaching-learning situation. This has been the focus emerging from the works of Garrison and Baynton, Juler and Moore. At another level the focus is on the psychological, as the effect of power relations manifests itself in cognitive processes. Bakhtin's analysis of the two types of assimilated discourse reflects this latter focus.

The terms 'power' and 'control' are being used either interchangeably or together as a single phrase with the one reinforcing the other. Either way, their use reflects an awareness that within any interaction, there is an exchange of messages, that specific messages will emerge in a dominant position in relation to others and that the dominant message will exert some influence on the formulation and/or interpretation of others. Fairclough's 'power in the discourse' and select aspects of critical theory provide the basis for the examination of power and control in this discussion.

Power in the discourse

The issue of power relations emerges as a core factor in Fairclough's perspective of discourse. He defines discourse itself as "language as social practice determined by social structures" (Fairclough, 1989, p.17), and in that context he makes

a distinction between power in the discourse and power behind the discourse. He contends that power in the discourse "has to do with powerful participants controlling and constraining the contributions of non-powerful participants" (p.46).

He makes three additional points about power in the discourse. First he states that the power which the dominant participant exercises may not necessarily be emanating from the participant himself or herself but indirectly from the discourse type that is being drawn upon. He describes discourse type as the conventional mode of talk associated with a particular type of social event, situation or practice, for example, a policeman interviewing a witness to a crime. Secondly, he advises that this power can also be hidden. Thirdly, he emphasises that the power in a discourse is fluid rather than static and that often it involves the breaking (at least temporarily) of the conventions of the discourse type that is being drawn upon. In the context of the third feature, he asserts.

whether one is talking at the level of the particular situation, or in terms of a social institution or in terms of a whole society: power at all these levels is won, exercised, sustained and lost in the course of social struggle (p.68).

A key factor of Fairclough's perspective is that ultimately, the power that is exercised within the discourse, is seen as emanating from the social structures within which the discourse is taking place. Indeed his recognition of the discourse type is itself an acknowledgement of the impact that societal factors have on a specific discourse event.

A critical theory perspective

The effect of power in all facets of human society is the focus of attention of the proponents of critical theory and their primary goal is the emancipation of the individual. Gibson (1986), summarising the main tenets of the theory, notes that advocates pay special attention to factors that prevent groups and individuals taking control of, or influencing decisions that affect their lives. Critical theorists accord a

central position to the individual in society and assert the powerfulness of individual endeavour. Thus, according to Gibson, they emphasise "the creative, active, meaning-seeking, need-fulfilling aspects of men and women, seeing them as potentially free and capable of achieving their self-set goals" (p.10).

Adult educators have sought to develop a theory of adult education within the framework of critical theory. Much of their work is based on the theories of Habermas and in particular, his notion of dominance-free communication. For example, Hart (1990) contends that "an educational theory that discusses and explains important educational phenomena with Habermasian categories, has to be firmly anchored in the idea of dominance-free communication and dominance-free forms of life" (p.129).

For his part, Pietrykowski (1996), while maintaining a commitment to the broad field of critical theory, argues for a reduction of emphasis on the ideal of attaining a fully emancipatory process and for increased attention to be paid to getting "an understanding of the forms of power that are attached to the creation and dissemination of specific knowledges" (p.82). He takes the position that "power is immanent in the act of knowing" (p.92) and in this regard he proposes that the focus of study should be "the diverse sources of power woven through our everyday discourse" (p.94).

Pietrykowski's outlook on power is more specifically rooted in a postmodernist perspective. Giroux (1990) notes that a primary feature of postmodernist thought is "its refusal of grand narratives, its rejection of universal reason as a foundation of human affairs, its decentring of the humanist subject ... and its celebration of plurality ..." (p.11). Not only does postmodernism oppose exploitative structures, it is also opposed to anything that is representative of centralised authority, a condition which it regards as being inherently oppressive of the human condition. Hence its rejection of grand narratives and universal reason.

Summary discussion

Both Fairclough and Pietrykowski locate their discussion of power and control within the framework of discourse. For Fairclough, the focus is on how social structures influence the way power is exercised within the language-using, interactive events that take place between human beings. His notion of a discourse type reinforces his outlook that the power emanating from any specific discourse event is largely reflective of a pattern of power relations that is consistent across all such modes of interaction and that this pattern is influenced by prevailing societal norms and conventions. However Fairclough also emphasises that the power relations associated with a discourse type is fluid rather than static and that it can be altered in any specific discourse event. For Fairclough, it is the social environment that one examines in order to develop an understanding of the function of power in the discourse.

There are two aspects of Pietrykowski's thesis that deserve further attention. First there is the position that power in everyday discourse emanates from diverse sources. When this position is viewed in the context of the author's stated bias towards postmodernist thought, there appears to be an intention that, in adult teaching-learning discourse (the focus of his discussion), equal recognition and weighting should be given to the messages linked to these diverse centres of power.

Such an outlook would require a more open-ended learning environment than currently obtains in the practice of adult education in general and professional education in particular. With regard to the latter, given the fact that what constitutes a profession is largely determined by broader societal factors, it would appear that the adoption of postmodernist principles could be highly problematic in a situation where the knowledge base of the educational enterprise must inform and support substantially well-defined modes of practice.

Nonetheless, Pietrykowski's position can serve to alert practitioners to the reality that, in spite of the norm of having stated goals, and in spite of the effect of institutional control, different voices articulating different meanings and representing

different sources of power are always a factor in a formal teaching-learning setting. Consequently Pietrykowski's recommendation to focus on the diverse sources of power in the discourse cannot be ignored.

Also of significance is his view of power being intrinsic to the act of knowing. In this regard his perspective gives clearer articulation to Bakhtin's view of the function of power in assimilated discourse. To varying degrees, all these theorists are recognising a dimension to power and control that more closely links this phenomenon to the cognitive processes of teachers and learners.

Conclusion

A core feature of the discussion on learner-knowledge interaction is that it cannot be seen in isolation of other factors. Three such factors stand out. First, while not subscribing to the constructivist perspective that learning is a social activity, the position taken here is that social and other environmental factors impact on the learning of the individual, a perspective that is shared by theorists who are as different in their outlook as Kaye (1992) and Procter and Parry (1977). Consequently the interaction that occurs between the learner and entities outside of the self, must be acknowledged when considering the internal cognitive activities of the individual learner.

Linked to this basic factor is the issue of the role of knowledge from external sources. It was noted that tension between discipline-based and experiential knowledge can impact on the way learners engage with their cognitive resources.

Then there is the issue of power and control. What has emerged from the discussions in this chapter is that how we build knowledge is inherently bound up with the way power manifests itself in the teaching-learning situation, not only at the level of the social setting, but also within the act of coming to know, as experienced by the individual learner.

It is therefore evident that learner-knowledge interaction involves a dynamic interplay among different factors. The extent to which it is effective, depends to a significant degree on how these factors are managed in the teaching-learning situation.

This chapter concluded the examination of the three aspects of the broad concept of interaction which were collectively proposed as an alternative to Moore's three types of interaction and Bates' two contexts for interaction. The three aspects were social interaction, learner-media interaction and learner-knowledge interaction.

CHAPTER 6

THE RESEARCH PROGRAMME

Introduction

As a forerunner to laying the groundwork for the research programme that was mentioned in Chapter 1, this chapter outlines the theoretical framework that informed the design, implementation and analysis of the two research studies that comprise this programme. To this end, the chapter draws on the discussions of the preceding four chapters to formulate an alternative, holistic conception of interaction. Then, in the context of that concept of interaction, the chapter describes the research programme. This description includes the statement of the research questions for each of the two studies undertaken.

Theoretical framework

The decision to explore interaction as a multi-faceted construct arose out of a concern that social interaction by itself could not adequately support the study and practice of teaching and learning in distance education. As a result, two broader conceptions proposed by Bates and Moore respectively were examined. Bates contends that there are two contexts for interaction, namely as an individual, isolated activity and as a social activity. Moore identifies three types: learner-content interaction, learner-instructor interaction and learner-learner interaction. Certain limitations were observed in both conceptions. Consequently two alternative types were identified, namely learner-media interaction and learner-knowledge interaction. These together with social interaction are being proposed as the three types of an alternative conception of interaction.

What was emerging at various points in the preceding discussion was that the three types could not be considered in isolation of one another. For example, a media-learning relationship was highlighted by Kozma in his perspective that media should be seen as supporting learning. A similar perspective was evident in Laurillard's use of her

Conversational Framework for classifying media according to their capability to facilitate certain teaching-learning functions. In addition, Jonassen's idea of cognitive tools extending on and amplifying the learner's mental models, also reflects this supportive relationship between media and learning. A similar perspective was not as clearly articulated with respect to the interactive telecommunications and computer-networked technologies. However it can be argued that, while the focus of study has been biased towards interpersonal interaction, there must of necessity also be an interaction between the learner and the technology and that the second type would be influencing the nature of the first. In light of the above, the interaction that the learner has with media is seen as providing support for learner-knowledge interaction.

In the earlier discussion on learner-knowledge interaction as an intrapersonal activity, it was noted that this function did not necessarily involve the individual in contact with other persons. Nonetheless, one recognises that there is always an interpersonal component in distance teaching and learning whatever the delivery mode. In fact in the context of the new interactive technologies, person-to-person interaction is emerging as a dominant feature of the distance learning experience. Consequently while highlighting learner-knowledge interaction as an intrapersonal function, it is important to recognise that it often takes place in social settings.

In light of the foregoing, it is necessary to view social interaction, learner-media interaction and learner-knowledge interaction as interrelated components of an integrated holistic concept. Further, given the types of relationships emerging out of the preceding discussions, learner-knowledge interaction should be recognised as the core component with the other two serving in a supporting capacity to the core (see Figure 6.1 towards end of chapter).

With regard to the two supporting components, interaction at the level of the media is viewed as carrying the primary facilitating responsibility, with social interaction being subsumed within it. This relationship is seen to exist whatever the media technology being used. In the case of the interactive technologies, interpersonal interaction is of necessity defined by the manner in which participants engage with the technological environment.

Even in the case of face-to-face tutorials, as practised in the second generation system, the communication between teachers and learners is largely determined by the participants' engagement with the course materials. For example, Crooks and Kirkwood's (1988) proposals for the design of interactive video includes one in which the medium acts as a stimulus to generate group discussion. In this regard, one recalls that some distance educators operating within this system (e.g. Lentell), seem to be querying the status of the tutorial in relation to other components of the distance education enterprise. The position taken in this study is that the problem does not necessarily lay in the tutorial occupying a subsidiary position but in the fact that, overall, its function is not sufficiently articulated. Regardless of delivery mode, interpersonal interaction in open and distance learning will always be subsumed within and defined by a broader media-related interaction.

The core component is therefore projected as simultaneously drawing on and shaping input from the other two. As noted earlier, the conception of learning that informs this study is that learners construct knowledge rather than acquire it. What this core component presupposes therefore is that the teaching function embedded in and made available through the other two, complements and facilitates this task of knowledge construction.

In projecting this notion of learning as knowledge construction and, by extension, meaning-making, it is evident that attention must be paid to the formal education systems within which one is seeking to operationalise this perspective of learning. One is very aware of the potential obstacles that can thwart the emergence of practices aimed at promoting this learner-centred outlook on education. These obstacles may appear at the level of the teachers, the students, the institution or the broader socio-cultural context.

Nonetheless, in defining learner-knowledge interaction, one draws on the perspective enunciated by Candy (1991) and cited in the preceding chapter that human beings construct rather than acquire knowledge, whatever the circumstances within which learning is taking place. As noted earlier, Candy sees learning as knowledge construction, whether the learner is "listening to a lecture, undertaking a laboratory session, attending a workshop, reading a text or engaging in any other learning activity" (p.272).

My own definition of learner-knowledge interaction draws heavily on this perspective, not merely as an acceptance of the inevitability of the notion of knowledge construction, but more importantly as a means of highlighting meaning-making as the ultimate objective of the learning process.

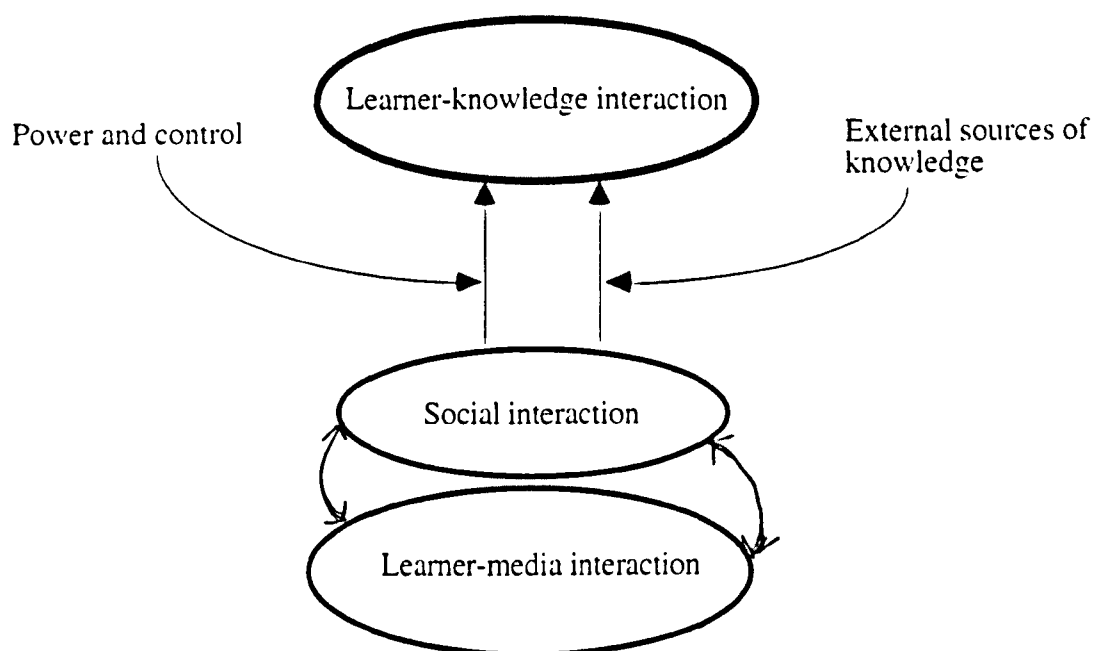
As recognised in the preceding discussion, the functioning of this three-part construct is influenced by two other factors, namely knowledge from external sources and power relations. Specifically, the redefined concept allows for a recognition of the epistemological orientation of the body of knowledge feeding into the interaction: whether one sees knowledge primarily as discipline-based theories or as experiential knowledge would impact differentially on the teaching-learning experience. The revised concept also recognises that power is a factor to be considered in all interaction, and that the way this power works is largely a function of the socio-cultural context within which the interaction is taking place. Moreover, it is to be noted that this power manifests itself not only at the level of the supporting components of the concept, but within the core component itself as noted in Pietrykowski's (1996) discussion on adult education.

Finally, while noting that the concept of interaction could have been developed from the perspective of either or both of the two sets of participants in the teaching-learning transaction, the decision was taken to adopt the orientation evidenced in Moore's three types and to formulate the concept from the perspective of the learner. Another factor informing this decision was that ultimately, it is the learner who must benefit from the interaction, hence the importance of focusing on this aspect.

In light of all the foregoing, the redefined concept being proposed combines the three subconcepts in the manner described above and recognises the influence of the two additional elements, namely external knowledge and power, on its overall functioning.

It is this concept that provided the framework for the examination of teaching-learning practices in the current teacher education offerings of the University of the West Indies. (Figure 6.1)

Figure 6.1: Revised Concept of Interaction for Open and Distance Learning



The research rationale

As noted earlier, the University of the West Indies is in the process of incorporating distance education into its teaching programme. As far as the Faculty of Education is concerned, it is envisaged that this would entail considerable expansion in the provision of professional development programmes at a distance for teachers and other practitioners in the education system throughout the Caribbean.

A research programme was therefore undertaken to examine the practice of teacher education in the faculty with a view to influencing the development of the faculty's distance education initiative. The research programme was designed within the framework of the revised concept of interaction and was intended to serve two purposes. First it would seek to get a broad picture of students' perception of their status as learners, both separately and in relation to their teachers. Given the demands that conventional distance education makes on its learners to function with minimum direct contact with the teaching institution, and given the more recent perspectives about distance learners assuming a more initiating role in their own learning, such an investigation was deemed appropriate in order to examine the

extent to which typical students of the Faculty of Education perceived themselves as being capable of functioning in a learner-centred educational environment.

Secondly the research programme was designed to examine knowledge building processes as these revealed themselves in a teaching-learning situation. The intention was to describe the nature of the learner-knowledge interaction taking place as well as to identify the factors influencing it. In this way, the focus of the investigation would be the process of learning rather than its outcome.

Both sets of investigation would complement each other and reflect the interrelatedness described between social interaction and learner-knowledge interaction in the redefined concept.

The two sub-studies

In order to implement the programme described above, two sub-studies were designed: an exploratory survey in relation to the first purpose and an observation study in relation to the second.

The exploratory survey

The survey itself was conducted within the framework of social interaction as discussed in Chapter Two. As noted then, social interaction by itself could not provide an adequate conceptual framework for examining all aspects of teaching and learning. However, it was also noted that the issues addressed by the respective discussants, hold important implications for the interpersonal exchange and the social setting within which teaching and learning take place.

Consequently this survey was based on selected aspects of collaborative learning, dialogue and learner control, all of which were examined earlier. From **collaborative learning**, the survey drew on the principle that teaching and learning should take place in settings that were not based on a rigid top-down relationship between teachers and learners but which encouraged greater equity in the role and status of these two sets of participants. The role of the group, which is also a feature of collaborative learning, was also addressed through this survey.

Dialogue provided the ideal that students are "the key agents in their own learning" and that they and their teachers should alternate between proactive and reactive roles in their communication.

Learner control, as developed by Garrison and Baynton (1987), was also represented in the survey. In developing this concept, the authors sought to provide a model of the factors necessary for learners to assume greater responsibility for their learning in collaborative environments. The authors interpreted learner control as "the opportunity and ability to influence, direct and determine decisions related to the educational process". To this end, Garrison and Baynton's model comprises three components, namely

independence, power and support. The survey sought to determine the extent to which these three attributes of learner control were represented in the student population of the Faculty of Education, UWI.

In light of all of the above, a survey was designed to address the following research question:

How do student-teachers perceive their learning experience in a formal education environment?

Specifically the survey would seek to examine student-teachers' perceptions of their roles and expectations as individual learners and in their relationship with their teachers (lecturers) and fellow students.

The observation study

This study was undertaken within the framework of learner-knowledge interaction as discussed in Chapter Five. It was aimed at examining the discourse that teachers and learners used with a view to analysing how participants were manipulating their cognitive resources (as revealed through the discourse) to facilitate knowledge building on the part of the learner. This investigation was seen as being consistent with the overall conception of **learner-knowledge interaction**.

The term **knowledge building** was used to refer to the process of learning in keeping with one of the core tenets of constructivism that people build or construct knowledge rather than acquire it. By extension, the study also upheld another key tenet of constructivism that, through learning, learners were engaging in a **meaning-making** exercise, geared towards arriving at their own personal interpretation of the world.

The study also recognised that **knowledge** from external sources fed into the cognitive processes of both teacher and learners. In this regard the study saw the need to pay attention to the way different sources of knowledge were impacting on one another and in the process influencing the knowledge building exercise itself. For the purpose of this study, the term 'knowledge', when referring to the external phenomenon, was used interchangeably with **information**.

Power, used interchangeably with **control**, was another factor taken into consideration in the observation study. In this regard the study drew on Fairclough's thesis regarding power in the discourse and sought to examine the factors that allowed one participant to occupy a dominant position and another a subordinate position in an exchange. It was also informed by Pietrykowski's concern that it is in the act of coming to know that the effect of power relations should be investigated.

The term **discourse** was used in this study to refer to the talk that teachers and learners used as they communicated. Precedence for this use of the term was found in Fairclough (1992) who highlights this aspect in his explanation. He states that discourse refers to extended samples of either spoken or written language, and he defines it further as "interaction between speaker and addressee, or between writer and reader, and therefore processes of producing and interpreting speech and writing, as well as the situational context of language use" (p.3).

While it is recognised that the terms 'discourse' and 'interaction' are normally used interchangeably, interaction was used as the broader term in this study, encompassing the three components of social interaction, learner-media interaction and learner-knowledge interaction. 'Discourse' was used to refer specifically to the talk and other communicative acts of the participants of the study. The discourse of both teachers and learners was examined in keeping with the view that both sets of participants were contributing to knowledge-building on the part of the learner.

The study also recognised as discourse the **non-verbal cues** of participants when those cues could be interpreted as communicating some recognisable message. Support for this interpretation of non-verbal cues was found in Wagner's definition of interaction. As noted in Chapter Two, Wagner (1994) defines interaction as reciprocal actions which she regards as being "verbal and non-verbal, conscious and non-conscious, enduring and casual".

In light of the foregoing, the observation study was designed to address the following question:

What does the discourse of learners and their teachers reveal about learner-knowledge interaction?

Specifically, the observation study would seek to,

1. describe the knowledge-building activities that learners engage in.
2. examine how teachers influence the knowledge-building activities of learners.
3. examine the effect of the power relations between teachers and learners on learners' knowledge-building activities.

The relationship between the two sub-studies.

The two sub-studies were developed out of two of the three types of interaction established as a result of the literature review, namely social interaction and learner-knowledge interaction. It was envisaged that linkages between the two would emerge at two levels. At one level social interaction would serve as the main support for learner-knowledge interaction in the observation study (learner-media interaction was not an area of investigation in this research programme). At another level, the findings of the exploratory survey could be used to illuminate and/or reinforce issues emerging from the observation study.

In this programme, the observation study was the main research activity and the survey, the subsidiary.

CHAPTER 7

THE RESEARCH METHODOLOGY

Introduction

This chapter outlines the methodology for each of the sub-studies. The first section describes the approach taken in designing and administering the survey and analysing the data derived from it. The second describes the activities undertaken in the preparation and conduct of the observation study⁴. The third section describes the procedures employed in the analysis of the data from the observation study. A separate section was allocated for this aspect, since the observation study was the main undertaking of the research programme.

The exploratory survey⁵

The instrument

A questionnaire comprising three subtests and based on selected attributes of *collaborative learning*, *dialogue* and *learner control*, was designed to address the objective outlined in the preceding chapter.

Subtest 1: Talking with lecturers

The first subtest was influenced by the concept of *dialogue* and was aimed at determining the extent to which teachers, as learners, saw themselves as occupying both proactive and reactive roles in their relationship with their lecturers. There were fourteen (14) closed items in this subtest representing reactive and proactive communication roles respectively. Examples of items in the *reactive* category were 'You

⁴ As noted in Chapter 1, the commonly used term 'observation study' is used to refer to the main aspect of the research programme, even though, like the survey, it is, in effect, a sub-study.

⁵ A paper derived from this survey was presented at the Sixth Cambridge Conference on ODL (see Kuboni, 1995).

ask lecturers to clarify a point' and 'You support a point made by a lecturer on some aspect of the course content'. Examples of items in the *proactive* category were 'You re-focus a discussion involving students and a lecturer which you find is drifting' and 'With other students you recommend changes to the overall programme of study'. This subtest was based on a Likert scale of 1-5, with 5 indicating the most positive rating of 'very often' and 1 at the other end, indicating 'never'.

Subtest 2: Which settings are most useful for which learning tasks?

The second subtest required respondents to think about each of twenty learning tasks, and indicate which of five settings was *most useful* for carrying out each of the twenty learning tasks and simultaneously, which of the settings was *least useful* for the each of the same tasks. This subtest was designed to investigate students' perceptions of the usefulness of different social settings. It was influenced by that aspect of collaborative learning that emphasises the function of the group and specifically the use of appropriate group settings.

Respondents were given the following instructions for this subtest:

Outside of the large group lecture/discussion sessions, there are other settings in which you carry out various tasks. Five settings have been identified and these are coded 1 to 5 below. A series of tasks has also been listed. For each task, circle the code for

a) *the setting which you consider most useful for carrying out that task*

AND

b) *the setting which you consider least useful for carrying out that task.*

If you feel that none of the settings is useful for a particular task, go straight to the 'none' column and circle 6 for that task. Please base your responses on your actual experience.

The settings with their codes are,

- 1. individual studying alone.
- 2. individual with one or two other students.
- 3. individual on one-to-one basis with lecturer.
- 4. small group session (15 or less) - students only
- 5. small group session (15 or less) - students with lecturer.

Respondents were then given a demonstration of the procedure for doing this subtest. This is reproduced in Table 7.1 below. The three tasks included here were for demonstration purposes only.

Table 7.1: Procedure for doing subtest

TASK	CHOICE OF SETTING		
	Most Useful	Least Useful	None
reviewing your notes	① 2 3 4 5	1 2 3 ④ 5	6
having a debate	1 2 3 4 ⑤	① 2 3 4 5	6
borrowing a book	1 2 3 4 5	1 2 3 4 5	⑥

The actual tasks were representative of four broad types namely, *studying the course content, project work, assignment-related tasks, activities related to the affective domain*. Table 7.2 provides examples of each of the four types of learning tasks that were actually used in the test.

Table 7.2: Examples of learning tasks

TYPE OF LEARNING TASK	EXAMPLE
Studying the course content.	Identifying central topics or themes of the course content. Relating your previous knowledge with knowledge you are now acquiring.
Project work	Drawing up plans for a project you are doing on your own. Negotiating roles for doing a class project.
Assignment-related tasks	Deciding how best to use data collected for doing assignments. Dealing with difficulties that come up while doing assignments.
Activities related to the affective domain.	Deriving satisfaction from learning. Finding reassurance when faced with personal problems.

Subtest 3: Taking responsibility for your learning.

The third subtest was designed to reflect the three dimensions of Garrison and Baynton's model of *learner control* and consisted of two sections. The first section comprised 12 closed items each with a 5-point rating scale ranging from 'capable' (5) to 'definitely not capable' (1). They were all aimed at identifying the extent to which learners saw themselves as being capable of engaging in *independent learner activity*. Examples of items were "Given a topic and a broad course outline, (you can) set your own objectives' and '(You can) negotiate methods of assessment on a one-to-one basis with a lecturer'. Instruction for this set of items acknowledged that the tasks listed may or may not have been part of the learners' prior or current learning experience. However they were asked to use their knowledge of themselves as learners to indicate how far they considered themselves capable of undertaking the tasks identified.

The second section of this subtest comprised four open-ended items. Two of these addressed the area of personal *power* (later referred to as competence by Baynton.

1992). Respondents were required to list three personal strengths and three personal limitations which they felt helped and hindered respectively their ability to manage their learning. The other two items dealt with the dimension of *support*. Each of these two required respondents to list three factors outside of the self that respectively facilitated and hindered their learning. The decision to solicit responses of both a facilitating and restricting nature for each of these two dimensions (power and support) was based on the view that one needs to recognise these opposing attributes in order to be optimally aware of the potential of the two dimensions.

The full text of the questionnaire is contained in Appendix 1.

Context of the survey

The survey was conducted among practising secondary school teachers pursuing the in-service post graduate diploma of education programme in the Faculty of Education, St. Augustine campus. This programme is delivered through the face-to-face mode and is implemented over a one-year period, with classes being held during the school term as well as during the vacation. It begins with a four-week period of intensive study during the July-August vacation. During the three terms, students are required to attend classes one day per week. Attendance is also required for a one-week period to coincide with the Christmas and Easter vacations respectively.

The programme combines theoretical and practical work and includes courses in the Sociology, Psychology and Philosophy of Education, and Curriculum. Students must also teach under the supervision of their Curriculum tutors.

The fact that these secondary school teachers were pursuing this programme in a face-to-face situation rather than at a distance was not considered a limitation in light of the objective of the survey. For the purpose of the survey, the key characteristic of the group of students was that they were practising teachers doing an in-service programme. In this regard, they were typical of the Faculty's current and projected student population. (The term 'student' is being used to refer to these teachers to reflect their current status as students in the Faculty of Education). Consequently, it was

envisaged that the perceptions which they would reveal about themselves would be applicable whatever the delivery mode employed in the Faculty's offerings.

In any event, apart from the limited audio-conferencing offering, at the time of writing, distance education was not a feature of higher education in the Caribbean. Thus the conventional face-to-face setting was the principal environment in which learning took place and from which learning experiences were derived.

There were 106 students enrolled in the 1994-95 programme and 75 completed questionnaires were returned. This represented 71% of the group targeted. The majority of respondents were within the age range 25 to 45 years. Fifty six percent (56%) fell within the 25-35 bracket and 25% were between 36 and 45 years old. There were 61% female and 31% male students. Eight percent (8%) did not indicate their gender. Ninety two percent (92%) possessed a bachelor's degree. The 75 respondents were specialising in eight curriculum areas with the highest concentrations in English (19%), Mathematics (19%), Science (15%) and Social Studies (13%).

The Procedure

The questionnaire was administered directly to students towards the end of the four-week period of full-time intensive study described earlier. One of the scheduled sessions was cancelled so that students could complete the questionnaire at a single sitting. Consequently only those present at the time took part in the survey. The questionnaires were distributed at the beginning of the session and collected at the end. Follow-up interviews were conducted with a small group of volunteers.

Data Analysis

Two limitations of this survey should be acknowledged at this point. First, because of the necessity to administer the questionnaire before the end of the July-August period of full-time intensive study, the instrument was not adequately pilot tested and item analysis was not done. Secondly, rigorous statistical analysis could not be done given the smallness of the sample size. There were only 106 students in the in-

tact group and even though the response rate was a satisfactory 71%, the number of returned questionnaires was less than one hundred. Thus only means and standard deviation were obtained and the findings must necessarily be treated as tentative.

The observation study

The second sub-study, the observation study, was located within the Certificate of Education programme offered by the Faculty through the university's audio-conferencing system, the University of the West Indies Distance Teaching Enterprise (UWIDITE). This Certificate programme is co-ordinated by the Faculty at the Mona (Jamaica) campus and is done by teachers at various sites in the countries of the English-speaking Caribbean.

The overall purpose of the observation study was to examine all factors related to learner-knowledge interaction as they revealed themselves in the teacher-learner interaction. In keeping with the intention to examine the interaction from the perspective of the learner, observation was done at audio-conferencing sites where students were located. The students selected for this study were observed at the two sites in Trinidad. At the same time teacher input was not ignored. Rather, that aspect of the interpersonal interaction was seen as feeding into and therefore exerting some influence on learner-knowledge interaction. It therefore had to be examined.

While the audio-conferencing environment itself was not the focus of investigation in this study, the capability of the UWIDITE system to allow for real-time interaction, made it possible to gain access to both teacher and learner input simultaneously. This was an advantage given the limited time available for data collection. Nonetheless, while not focusing on the medium, the study paid some attention to the effect that media-related factors had on the teaching-learning interaction.

This section on the methodology for the observation study is further subdivided into six subsections. The first subsection sets the stage by establishing the context in which the study was undertaken. This is followed by a description of the steps taken to prepare for the fieldwork. The third provides an overview of the two data collection

methods used during fieldwork, namely observation and interviewing. The fourth describes the observation procedures in detail and the fifth does the same for the interview component. The final subsection is devoted to an evaluation of the entire fieldwork exercise.

Context of the observation study.

Two conditions combined to define the environment for this study. First there was the certificate programme of study and secondly there was the audioconferencing medium.

Programme of study

As noted earlier, the student-teachers observed were pursuing the Certificate of Education. This programme is targeted mainly to primary school teachers and its aim is to update and extend the professional knowledge and competence of serving teachers (Faculty of Education, UWI, Mona, Jamaica, 1993). It is offered in five specialisations and students register to pursue studies in one of the five. Entry requirements stipulate that students should be practising teachers with basic teacher training qualifications and a minimum of three years service. Alternatively, applicants with no formal teacher training but with ten years teaching experience may also be admitted, once there is evidence that they have been declared as qualified or certified teachers by the competent authority in the country of their professional practice.

The Certificate of Education is a part-time, in-service programme and lasts four semesters (terms) spread over approximately two calendar years. The first three semesters are dedicated to the delivery of courses on-line, through the audio-conferencing system. Typically, these three semesters would comprise a core component of weekly on-line sessions, supported by related print materials. In the fourth semester there are no on-line sessions and students work with a local supervisor (tutor) in preparing for and actually doing their Practicum (examination of classroom practice) and their Study, a piece of action research linked to the Practicum.

The programme in progress during the period of fieldwork had begun in February 1994 and was due to end in December 1995. The field work itself took place during the third semester, that is the last on-line teaching semester, and it lasted for eight (8) weeks from January to May, 1995.

The medium.

Most sites on the UWIDITE audio-conferencing system are connected by two pairs of phone lines. At each site both pairs function simultaneously receiving and transmitting information respectively. The lines of all sites converge at a hub in the island of St. Lucia. They remain permanently connected thus allowing for ongoing communication. An exception to this pattern is the Belize site which is not served by dedicated lines. Whenever a connection is required, an operator from Belize must dial through to the hub in St. Lucia using the regular telephone lines.

All sites are equipped with a telewriter which is a graphics tablet with a stylus that is linked through appropriate software to a computer, also at the site. In turn, this computer is connected by a pair of modems to the two telephone lines serving the site. Through this connection, information from the telewriter, as well as from the computer itself, is transmitted to the hub in St. Lucia, which re-transmits it to all sites.

There are two sites in Trinidad, one at the campus in St. Augustine and the other in the town of San Fernando, some twenty miles from the campus. The site at the St. Augustine campus is currently housed in a small room in the university's main library. The room is laid out in a west-east orientation. Three rectangular tables take up most of the space. The computer, with modems, telewriter and the convener (audio control system) are spread out across the front table, facing the east wall. In the middle of this table is a microphone to be used by a lecturer if a course is being delivered from this site. The other two tables are arranged in an L-shape behind and to the left (north) of the front table. About ten microphones, for use by students, are spread over these tables. Additional chairs are arranged along the south and west walls. There are no microphones provided for the occupants of these chairs. The seating arrangement is

such that if a session is being conducted from this site, the students would be behind the lecturer and both lecturer and students would be facing east.

A shelf constructed against the east wall at a level about two feet higher than the front table, holds the slow scan TV equipment (not in use), a TV monitor for the display of output from the computer or telewriter. Mounted above this shelf on the wall are two speakers which are connected by a headphone jack to the convener. The volume of the two speakers is controlled by a knob on the convener.

Access to the room is through the only door at the south-east corner (Figure 7.1).

While the orientation was different, the San Fernando site was organised in a manner that was more or less similar to that of the St. Augustine site.

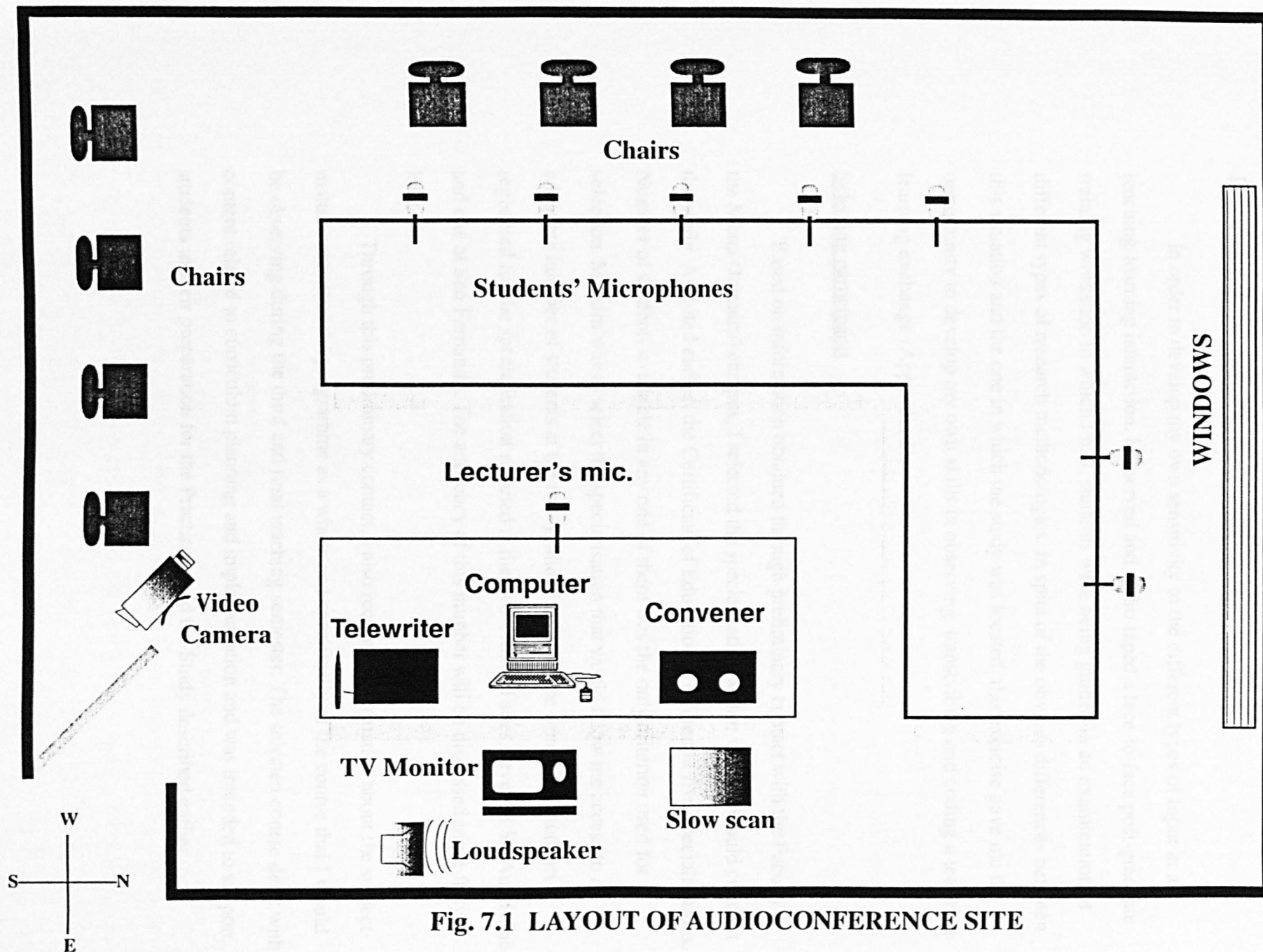


Fig. 7.1 LAYOUT OF AUDIOCONFERENCE SITE

Preparation for the fieldwork

Developing skills

In order to develop my own sensitivity to the different types of input in a teaching-learning interaction, I observed and audio-taped a face-to-face post-graduate training workshop in which Ph.D. students were being guided in an examination of different types of research methodologies. In spite of the obvious differences between this situation and the one in which the study was located, this exercise gave me the opportunity to develop my own skills in observing, transcribing and coding a teaching-learning exchange (Appendix 2).

Selecting participants

Based on information obtained through preliminary contact with the Faculty at the Mona (Jamaica) campus, I selected the specialisation within which I would conduct the study. As noted earlier, the Certificate of Education is offered in five specialisations. Number of students available in any one of them was the only criterion used for selection. My aim was to select the specialisation that would allow me access to an adequate number of students at the two Trinidad sites. There were eight students registered for the specialisation selected at the two Trinidad sites, seven at St. Augustine and one at San Fernando. The adequacy of this number will be discussed more fully later.

Through this preliminary contact, I also received information about the subject matter content of the programme as a whole and specifically of the course that I would be observing during the third and final teaching semester. The selected course dealt with content related to curriculum planning and implementation and was intended to support students in their preparation for the Practicum and the Study described earlier.

Gaining access to the fieldwork site

I sought permission from the Faculty administration at Mona as well as from the co-ordinator of the specialisation selected, who was also based at Mona. The co-ordinator was also scheduled to teach the course that I would be observing. The request letters that I wrote to the administration and the co-ordinator lecturer, was accompanied by an overview of my thesis proposal. I also made contact with the local supervisor in Trinidad and through her, with the students. I wrote individual letters to the students.

In my correspondence to all of the above (in more detail to some than to others), I described the proposed study and stated my plans for the involvement of the lecturer and the students. I informed them that I would be videotaping the students during on-line sessions and conducting two interviews with each of the students. I also stated then that I intended to conduct group discussions with the students. This latter idea was subsequently abandoned. I emphasised to both lecturer and students that I would only be observing and would not be interfering in the conduct of the sessions. I also sought to assure the students that I would make every effort to schedule interviews so as not to disrupt their work and domestic responsibilities unduly (Appendix 3).

Prior to leaving the UK for Trinidad, I made preliminary enquiries about the availability of video equipment. I also developed a schedule of work for the eight-week fieldwork period.

Initial contacts

On my arrival in Trinidad, I held familiarisation meetings with the students prior to my observation of the on-line sessions. Six of the eight students were teaching at the same school and the other two were at two other institutions. I therefore held three meetings at the respective places of work. In the first meeting, with the group of six, students (teachers) had only a vague memory of my letter of introduction although they acknowledged that they had received it. I also sensed that they were apprehensive about my intentions. This was understandable since none of them knew me.

Another likely contributing factor to their uncertainty was that, even though I had received permission from the authorities, as well as the welcome of the local supervisor (which they knew about), I did not meet with them in the presence of any of these authorised personnel. The fact that the local supervisor was aware of my visit and was the one who had distributed the letters that I had written to each of the students, was apparently not enough to sanction my presence.

My assessment

The role and status of the local supervisor deserves attention at this point. Although there were periodic contacts between her and the students, and there was a good relationship between them, she did not have a major responsibility during the teaching part of the programme. As noted earlier, she became more directly involved for the Practicum and the writing of the Study during the last semester. On the whole, in her capacity as local supervisor (tutor) she could not assume the formal responsibility for authorising my presence. On hindsight I think that I should have obtained a formal letter of introduction from the Mona administration.

It is likely therefore that the students had difficulty in recognising my authority since from their point of view, it was not appropriately sanctioned. It is my view that, had these students been constituted as a conventional face-to-face class, with a teacher (lecturer) permanently present, their initial response to me may have been different.

At this meeting with the group of six, therefore, as well as in the subsequent meetings with the other two students, I realised that I needed to establish my credentials both as researcher and as a member of the academic community of the Faculty of Education. I therefore reiterated the purposes of the study, emphasised its significance in the context of the university and sought to reassure the students that I did not intend to intrude. I think that I had some success in removing barriers since there was greater openness in our subsequent meetings. During the meetings I also made tentative arrangements for the first set of interviews. Overall, these were scheduled to take place at the respective schools during the one-hour lunch period.

Other arrangements

I also contacted the lecturer in Jamaica by telephone to reconfirm arrangements. She asked to be reminded about the purpose of the study and asked several questions about this. After re-stating her agreement with the project, she informed me that the particular specialisation was in transition, that it was being revised and that I should take that into consideration. She did not elaborate and I did not question her further on that matter.

She also asked whether I wanted her to introduce me at the first session. I declined the offer since I wanted the study to be conducted in an unobtrusive a manner as possible. Any announcement on the audio-conferencing system would have alerted students at the sites in the other countries about this event in Trinidad and I was not sure how this publicity would have affected the attitude of the Trinidad students. On the other hand, given my subsequent assessment about the absence of a formal official introduction, it may have been to my advantage to accept.

I also re-established contact with the local supervisor. While recognising her limited role, I thought it important to maintain a link should any problems arise.

Finally, I concluded arrangements with the Faculty of Education, St. Augustine (Trinidad) campus for the use of the video equipment for recording the sessions. I had my own audio tape recorder for recording the interviews.

Schedule

In summary, fieldwork for this observation study was planned to last eight weeks. It would take place in the third semester during the period March 8 to May 13, 1995. As mentioned earlier, the semester itself extended from January to May, thus I was conducting the study towards the end of the final on-line teaching semester. This situation could not be avoided since I was not able to complete my own preparation for the research exercise earlier. While I recognise the disadvantages of my timing for the fieldwork exercise, I considered it important to spend time clarifying my own research focus than to attempt to enter the fieldwork environment at a more appropriate stage but

without adequate preparation.

The study was planned to involve eight students pursuing one option of the Certificate of Education, at two UWIDITE sites in Trinidad.

Data collection procedures

The two main data collection methods were observation and interviewing.

Observation

As noted earlier, I observed students during the on-line sessions at the two audio-conference sites in Trinidad. Several types of data were collected from my observation of these sessions.

Types of data collected

The primary data collected were the one-to-one verbal exchange between the teacher (lecturer) and the respective students. These data were important since the aim of the study was to examine the knowledge-building activities that the student-participants of the study engaged in as revealed in the verbal exchanges. The verbal exchanges also contained material not directly linked to knowledge-building in relation to the course content. For example there were administrative matters to be settled and friendly exchanges. Such material was not considered for inclusion since it was not relevant to the study.

The decision to collect data from both the teacher and the learner reflects my own perspective that, in a formal education environment, learning, that is, learner-knowledge interaction, needs to be examined in the context of its relationship with teaching. In this regard, the approach taken in this study differs from that observed in some areas of the recent literature where the concentration on the learning function has meant the virtual exclusion of the teacher role.

While the main data were derived from the official on-line talk of lecturer and students, attention was also paid to other pertinent elements of learner behaviour. Specifically, data of off-line exchanges among students at the site were also collected if

they were regarded as being related to the teaching-learning interaction. Gestures and other forms of non-verbal communicative behaviour by the students were also recorded if they too were considered relevant. Both these forms of communication were considered as aspects of the discourse (see earlier definition) and treated as subsidiary to the 'official' on-line communication.

The data collected were regarded as comprising a series of teaching-learning *episodes*. An episode was identified where a self-contained meaningful unit of teaching and learning was recognised. Episodes were of varying duration and several episodes were identified in a single session. Episodes were not seen as being representative of the students participating in the study. They were not to be used to generate quantitative data. Neither were they to be reconstituted for the purposes of examining a developmental process. Rather they were seen as providing critical incidents that could be analysed in their own right within the context of the overall aim of the study, which was to examine all factors related to learner-knowledge interaction.

Given this focus on the data as a collection of episodes, I considered the eight students registered for the specialisation selected in Trinidad, an appropriate number of participants for the study. I envisaged that ideally, this sample of eight observed over six sessions, each of two hours duration, with an average of two episodes identified for each student, should provide a sufficient amount of data that was also capable of generating enough variation in terms of knowledge-building activities. In estimating the value of this sample size, I was also aware that all of the eight would not be present at all sessions observed. However if absenteeism were to reach a maximum of four per session, I envisaged that I would still be able to attain my overall goal in terms of amount and variation of data collected.

Rationale for videotaping.

Videotaping was considered the most appropriate means of recording the observations for four main reasons.

By using this mode I was able to record the gestures, facial expressions and other forms of non-verbal communication given by the students in response to some verbal input from the teacher. As stated earlier, I included these as part of the data given my own interpretation of discourse. It also allowed access to the private off-line activities of the students both individually and in groups. Such activities were considered important where there was some discernible connection with the formal teaching-learning transaction.

This mode of recording my observations also made it possible for me to record the physical setting of the study and in addition to take note of the manner in which it was used by the participants.

Finally, for the purpose of future data analysis, it served as an accurate reminder not only of which student spoke or did something, but also of the circumstances surrounding their statements or actions.

In addition to the above, the video recordings provided audio information from the other sites. This included the lecturer's input as well as that of students at the other sites. While the lecturer's contributions were an integral part of the study, those of the students at the other sites were not. Consequently these were largely ignored. However there were instances when aspects of students' contributions from other sites were part of an exchange in which one of the participants of the study was also involved. These would be recognised as data to provide clarity and continuity in a given episode.

As stated earlier, these recordings provided information of the private off-line activities of the students. However, sometimes these activities would involve talk muttered under the breath or in a low tone to a fellow student. Sometimes this talk would have been audible enough to be picked up by the single microphone attached to the camera. At other times, it was not. In those instances, I had to rely on the non-

verbal cues only.

To gain optimum access to these private conversations would have necessitated the use of additional and more sensitive microphones positioned in close proximity to the students. This additional equipment was not used partly because its use would have required too much extra set-up time before the start of a session. The sites were also used for other courses, hence it would not have been possible to leave such equipment installed over the eight-week period.

It would also have broken my commitment to the students and the lecturer that I would not be intrusive. In any event, obtaining this additional equipment would have necessitated too much time, effort and probably money that I could not afford. Moreover, while the use of these additional resources would have enhanced the data collected, I do not think that the overall aim of the study was compromised by their absence.

Interviewing

Interviews were used to clarify and/or amplify data collected through observation. Only the students were interviewed. The teacher was not interviewed because, as stated earlier, it was the learning function that was emphasised. While interviewing the teacher may also have contributed to this objective, this could not be accommodated within the time allocated for fieldwork. In any event, it was envisaged that observation would have provided adequate and appropriate data on the teacher role to fulfil the purposes specified. Based on the above considerations, interviews were designed to allow for the emergence of specific types of data.

Types of data collected

One noted feature of the on-line communication was that there were several episodes that were dominated by teacher talk, with students alternating between listening, note taking, engaging in private off-line conversations about what was being transmitted, and also losing concentration. Even though there was no formal verbal input from the students during these presentations, the position taken was that learners

were engaging with and manipulating knowledge in response to what was being transmitted. Specifically, it was argued that learner-knowledge interaction would have been taking place even though there was no overt interpersonal interaction between teacher and student at those times.

As noted earlier, this perspective of the concept of interaction is shared by Wagner who asserts that interaction involves reciprocity in actions and responses. Further, she recognises reciprocity whether the actions/responses are verbal or non-verbal, conscious or non-conscious, enduring or casual. Drawing on this definition, the interview was used, in part, to get students to externalise and verbalise responses and/or reactions which they may have had to statements made by the teacher on-line. In this regard, segments of the teacher's presentations were selected and re-presented to interviewees to examine their understanding, interpretation and/or evaluation of the selected content.

In cases where there was an actual dialogue between the lecturer and a student, I would seek to get the relevant student to extend on his or her contribution to the exchange. Probably the student may have appeared satisfied with the outcome, in which case I would seek to find out the basis of the satisfaction. The same would apply if the student appeared dissatisfied. If the student had initiated the exchange, I sought to find out the reason for this. I was also interested in getting the reactions of students who were listening to the exchange. In addition, interview questions could be triggered by students' non-verbal cues.

The interview process combined two categories of questions, namely those that were specific to a particular interviewee, based on his or her actions or responses during the sessions, and those that were more general, which I had created out of the overall teacher-learner interaction.

I also included two topics that I had decided to investigate prior to the start of the fieldwork. These were students' approaches to reading and note taking as they perceived them both in the current sessions and in their learning experience overall. The examination of approaches to reading was intended to generate data on learner

interaction with print and the focus on note taking was inspired by Juler's (1990) notion of 'student text'. I included this topic to determine the extent to which the act of note taking reflected students' intentions to create their own 'texts'.

Other data collected in the interviews were students' personal history, their reasons for pursuing the programme, their views on learning by audio-conferencing, and, since they were all practising teachers, their perspective of the institutions in which they were employed. All interviews were audio taped.

Conducting the observation

In this subsection I describe the various facets of the observation exercise. This includes a profile of the participants, a description of the fieldwork operations, a statement of problems encountered and a description of the adjustments made to address those problems.

The participants

Seven of the eight students identified as participants in this study were located at the main UWIDITE site at the campus in St. Augustine and the eighth was at the second site at San Fernando. The lecturer for this group was at the Mona site in Jamaica.

There were four students present for the first session at St. Augustine. At the second session, there were two. While I had catered for some level of absenteeism, I felt that the situation with this group was too unpredictable and I could not be certain whether I would turn up for a session and be the only one there for the entire two-hour period. Consequently, I decided to co-opt another group of students into the study. Fortunately, a course in a second specialisation of the Certificate of Education was also in progress and there were four students doing this course at the main site. In addition, the lecturer for this course was also based at the St. Augustine site. This factor considerably reduced the time required to get permission to include this group into the study. There were now twelve student-participants, with eight in one group (Group A) and four in the other (Group B). Both groups were pursuing different options of the

Certificate of Education.

Group characteristics

There were some noted differences between the two groups. In Group A there were seven female and one male student. Their average age was twenty nine (29) years and they had an average of seven years teaching experience, ranging from two to eleven years. In Group B the four students were all female. Their average age was forty four (44) years and they had an average of eighteen years teaching experience ranging from eleven to twenty seven years. The members of Group B were older and had more teaching experience than those of Group A.

The four students of Group B occupied the same site as their lecturer while the lecturer for Group A was in Jamaica. In concrete terms, this meant that the Group B students had greater access to their lecturer. Before and after a session, there were informal exchanges and students would use these occasions to engage the lecturer in further discussion on course-related matters. To maintain equity in the treatment of the two groups, I did not record these exchanges.

Being at the same site (i.e. in the same room) with their lecturer, also meant that a situation existed in which there could be face-to-face contact between students and lecturer during a session. However, while there were some exchanges, this was the exception rather than the rule. There were two reasons for this. First, the lecturer had to maintain management of the on-line communication and so could not allow herself to be distracted from this task. Secondly, the physical layout of the room, as described earlier, militated against face-to-face contact. The lecturer occupied the front table with her back to the students. Hence, as was the case with Group A, official exchanges took place on-line. Group B students appeared comfortable with this arrangement.

Whether because of the difference in age and experience or in the location of the lecturer, the Group B students were more settled during sessions than the younger Group A set at the same site. This is not to say that members of the former group were always task-focused. Rather their non-task related activities were less frequent and less

overt than those of the Group A cohort. Group B students also attended more regularly and were more punctual.

My worst fears about Group A did not materialise. While all seven students of the group at the St. Augustine site were not in attendance at all sessions observed, there were always two or more of them present. However, because of the irregularity in their attendance, the overall data collection exercise was not as systematic as I had originally planned.

With regard to the lone Group A student at the San Fernando site, I had to postpone plans to videotape her and remain at St. Augustine for as long as was necessary to record as many students in session as possible. Eventually, I did not videotape her since my three attempts to do so were unsuccessful. On the first of the three occasions, there was the first complete breakdown of the system during the fieldwork period and the session had to be aborted soon after it had begun. Before each of the other two scheduled sessions, the student phoned to inform me that she would not be attending because of personal/domestic reasons. By this time we were already into the month of May, the end of the semester, and I suppose that although her overall attendance was better than that of her counterparts at St. Augustine, she too was withdrawing. While I did not have a video recording of her in a session, I decided to retain her as one of the participants since I had captured her on-line contributions in previous sessions during videotaping at the St. Augustine site.

My original plan for interviewing was also affected by the irregular attendance of the Group A students. In my correspondence to them prior to the start of the fieldwork, I had indicated that I would be interviewing each of them twice. My intention was to draw on their input during the on-line session to build the interview questions. With the high level of absenteeism, this idea had to be adjusted. Hence, those who attended more regularly were interviewed twice and the others only once.

The final sample comprised eleven (11) participants, seven in Group A and four in Group B. Ten were at St. Augustine and one in San Fernando.

Operations at the main site

Given the layout of the room and the fact that students of both groups occupied the rear L-shaped table facing east, I set up the camera near to the door at the south-east corner of the room since that position offered the best possible view of the students. The camera was also positioned a little to the left of one of the loudspeakers and was therefore appropriately placed to capture the audio output.

The camera was mounted on a tripod and since I was only interested in a single shot of all the students, I locked it and sat elsewhere to avoid being in direct face-to-face contact with the students. I would normally occupy one of the chairs along the south or west wall. In either position, I was still able to monitor the activities and take my own notes.

Managing the non-participant observer role

While I was not completely out of their view (the room was too small and there were too few persons in it to allow for that), I think that the students were able to ignore my presence because I was not sitting in their line of vision. Another factor which I think contributed to reducing the focus on me was the fact that they were used to having a non-student in the room. A technician was expected to be present whenever a session was in progress. Two technicians alternated in a single session and one of them normally sat at the back of the room. We often sat together, sometimes chatting in subdued tones. This link with someone whose presence was accepted, could have helped me to 'blend into the landscape'.

Students' behaviour during observation.

It was evident that the students' behaviour had not changed because of my presence or that of the video camera facing them. Rather the activities that they engaged in during the period of the study seemed to be no different from what they would normally do.

Students could be seen chatting among themselves. At times their conversations seemed to be task-related, for example when a latecomer or someone who had missed a previous session was being brought up to date on work missed. At other times, they did not appear to be task-related. On some occasions students would leave their seats to go to the shelves in the north-eastern corner of the room in search of materials that were the focus of study at that time. In one session, one student spent a fairly long period of time reading a newspaper, after having given an official excuse on-line why she could not participate in the group discussion.

I would say that the students were comfortable in the environment. This was particularly evident in their use of the microphones. They were very adept at dispensing with a microphone that was not working and getting another. At times other members of the group would help in the selection process. Given that this was the third (and final) semester of on-line sessions, students had become quite capable users of their environment.

Technical problems

In addition to the issue of irregular student attendance, there were also difficulties with the functioning of the audio-conferencing system. There were students at a site in Belize on the mainland of South America for both courses observed and in both cases there were periodic problems between the Belize site and the rest of the system.. Normally, there would be a delay in message transmission from any other site to Belize. Hence if a question was put to a student at that site, there was a delay between its reception and the subsequent response. Quite frequently though, either the initiating remark or the corresponding reply would not be received because of the poor quality of the communication system linking that site to the rest of the system. Thus it was often the case that students in Trinidad and indeed all the other sites would have to sit and wait for the completion of an exchange between the lecturer and a Belize student which, in many instances, would be disrupted and remain incomplete because of technical failure.

Belize was also timed to go off-line at a set time. Very often, this would occur before the session was terminated. On such occasions, shrill, intermittent beeps could be heard throughout the system and all communication had to be suspended until they had ended.

There were also constraints with the use of the telewriter. Because of its connection to the same telephone lines carrying the audio signals, all oral communication had to cease when this equipment was being used at any site, otherwise there would be interference and a resulting loud noise throughout the system.

Overall, the sound quality was reasonably adequate. At times though, communication would be either disrupted or distorted because of technical problems. As a result, there were periodic requests for repeats. More often than not, repetitions were re-phrased, abbreviated versions of the original, with the likelihood of a shift in meaning, however slight.

The effect of such disruptions was noted on one occasion when the San Fernando site was cut off during a group discussion among participants of Group A. When contact was re-established, the discussion had already progressed and the initial topic had been adapted. The lecturer repeated the adapted topic for the benefit of the lone Group A student at San Fernando. Based on her response, it was evident that she was responding to the initial question. She had no doubt prepared a contribution to the original topic and wanted to make it. Her input was therefore inappropriate at the time when it was made. The lecturer, apparently recognising what had happened, summarised and closed the discussion, very likely prematurely.

It is also likely that, given the uncertainty about if and when there would be an interruption or a deterioration of sound quality, the lecturers may have found it necessary to resort to the information-transmission mode in order to ensure that aspects of the content considered important, were communicated.

Overall, the initial uncertainty brought about by the irregular attendance of the Group A students and the periodic technical flaws in the communication system, were the two major problems encountered during observation.

Summary

I videotaped four Group A and three Group B sessions. For reasons stated earlier, only audio data were obtained for the student at the San Fernando site.

Conducting the interviews

As already stated, interview questions were of two broad types. One type was closely linked to what specific students said or did in a session while the other type drew on the overall teacher-learner interaction and was broader in scope. The first type was used in the first set of interviews and the second type in the second set. It was intended that each student would be interviewed twice, but because of the absenteeism problems cited earlier, and the adjustments that had to be made because of them, some of the eleven participants were only interviewed once.

Examples of questions

With regard to the specific questions, in one of the first set of interviews, one student was asked about two issues which he had raised with the lecturer. First he had asked about her position on repeating a lesson if the objective was not achieved in the first trial. Then he had raised a problem of his own regarding appropriate strategies for handling varying ability levels in a single group. I decided to pursue these two issues with the student because his non-verbal behaviour during the exchange suggested that he may not have been entirely satisfied with the way the issues were handled.

In another of these earlier sessions, the lecturer was introducing students to the notion of the integrated unit and encouraging them to adopt this approach to curriculum implementation in their classroom practice. Students' on-line questions and off-line private reactions suggested that they held differing perspectives on the topic, hence my decision to question them about it. At the broader level, I developed questions to cover five aspects of the overall interaction.

Interaction between old and new knowledge

This group of questions was intended to get students to examine how they handled new knowledge that appeared similar to knowledge that they already held in memory but which was potentially in conflict with that old knowledge. I selected the umbrella topic of evaluation and assessment which was dealt with by both groups and formulated basic questions around three aspects of this topic. I put the question in this way to one student:

Teacher educators are saying that, under the present approach, the traditional approach to assessing students, they, the students, become too dependent on grades and test scores. The current thinking is that students must develop their own self-assessment skills, right? So, some of the new approaches, for example, portfolios, provide the opportunity for students to develop the ability and the know-how to evaluate and assess their own performance as learners. This is one of the principles underlying the new approaches to evaluation and assessment. I want to hear from you now, how do you feel about that? Do you feel comfortable with that kind of perspective?

Delayed response to intra-session events

This section of the interview was based on the premise that during sessions, the lecturer and sometimes a fellow student would have made statements but at the time, the student currently being interviewed would not have made any overt corresponding remark. However, that student may probably have had some response that remained unverballed. This may have happened because at the time in the session, the interviewee did not recognise a clear opportunity for articulating the response or probably he/she was not sufficiently focused. I therefore selected two segments of the videotaped data from each of the two groups, made audio recordings of these and played them back during the interview. I then asked the respective students to react in any way they saw fit both to what was said and to how it was said. I chose to keep this question very open-ended to avoid restricting students to a particular type of response.

The two segments were of two types: one was lecturer-presentation of information and the other was a segment of dialogue between the lecturer and a student. For example, the Group B students were asked to respond to an information-

transmission segment on 'semantic webbing' as well as a discussion between the lecturer and a student from another site on the value of some commercially prepared reading materials being used in some Caribbean schools. This technique of re-presenting the data in an audio-taped form within the interview was intended to re-enact the actual situation and, as far as possible, to allow students to view the communication from the same standpoint as that which they occupied during the session.

Internal preparation to respond to teacher-presented questions

In this section of the interview, I repeated verbatim questions which the lecturers had put to the respective groups to stimulate discussion. My intention here was not that students should formulate a response, but rather that they should 'talk out' the internal processes that they engaged in to prepare a response. In my instructions to each interviewee, I introduced the task in this way:

I have made a list of some questions that (lecturer name) asked during some of your sessions. They were questions that she threw out to the whole group to get you thinking about some aspect of the course or some reading. I am going to put three of those questions to you again. But I don't want you to answer them. What I want to know is how you prepare inside your head to answer the question.

I concluded the instruction in this way:

So I am going to be repeating three questions that (lecturer name) asked and I want you to talk out what you are doing inside your head as you are working out how to answer to answer each of them.

Examples of questions put to the respective groups were,

1. What are the things you have to put in place before you can formulate an appropriate checklist?
2. What would you do with this story in the classroom to facilitate students' understanding of it?

Potential long-term effect of lecturer 'talk'.

I put it to the interviewees that there are things that teachers say and/or do that remain stuck in students' consciousness for a long time after a period of study. I asked them if there was anything in their soon-to-be concluded course that was likely to remain with them, and if yes, whether they could identify it.

Student overall assessment of course

I asked participants whether, having come to the end of the course, they thought that there was anything not dealt with or not adequately with, which they felt should have been included, or better handled. I also sought to find out whether they had raised these issues with the lecturer or other students.

Summary

In all, fifteen interviews were conducted with the eleven participants. This uneven number of interviews resulted from the fact that some participants were interviewed twice and others only once. The reason for this situation was discussed earlier. Each interview lasted approximately thirty five minutes.

Evaluation of fieldwork

The observation

It was evident that the two problems described above would have had some effect on the conduct of the observation. The uncertainty about the attendance of the Group A students necessitated substantial changes in my original work schedule. Specifically my decision to alternate observation sessions with interviews had to be altered. Further, as stated earlier, I was unable to pursue the original plan of interviewing each student twice. Indeed my later decision to use a more generalised interview format for the second set of interviews was influenced in part by these prevailing circumstances.

Nonetheless, this setback did not significantly affect the underlying purpose of the study. It was the teaching-learning episode, supported by segments of interview data that was the focus of the study, and not the individual student. Consequently the data generated were not seen as contributing to the profile of a particular individual but as examples of the knowledge-building events in the teaching-learning interaction being observed. I had collected an adequate amount of data with sufficient variation in terms of the knowledge-building events that they embodied.

The adverse effect of the technical problems described above were also minimised given my focus on episodes of the overall teaching-learning interaction rather than sessions taken as a whole. In spite of periodic disruptions, it was never the case that an entire session would be completely lost. In any given session there was sufficient data collected to allow for the identification of episodes.

The interview

I eventually realised that some of the issues that I had brought up in the interviews could not be adequately addressed in that context and I decided to eliminate them from the data to be analysed. There were three such issues, namely note taking, approaches to reading, and students 'talk out' of their internal preparations prior to responding to a teacher-formulated question. In the case of note taking I wanted to find out the extent to which notes could be seen as 'student texts', that is, the vehicle for student expression of their own perspectives in a formal teaching-learning environment (Juler, 1990). What I realised was that, based on students' description of what they did while taking notes, the notion of the student text did not necessarily apply to the act of note taking in this context. What they said they wrote during a session was largely what they had received from the lecturer. It soon became clear that the interview -strategy adopted was not appropriate for exploring students' self-expression or, for that matter, the note taking function itself.

I also attempted to address the issue of students' reading. In some instances, this was introduced incidentally, as an offshoot of another topic. In other instances I

sought to focus on reading processes, as an aspect of students' interaction with print media. Neither of these generated data that I considered useful. On hindsight, I thought that the issue of reading processes was not very relevant to the core purpose of the study.

With regard to students' internal processes when responding to a question, I found that they (the students) were having difficulty articulating their thought processes and that they were generally unwilling to invest the necessary effort to accomplish this task.

It is likely that the open-ended interview format that I used was not an appropriate tool for investigating any of these three issues. On reflection, I think that they required a more controlled research environment, using more focused investigative strategies.

Other issues

Apart from the above, there are three further issues arising from the overall fieldwork exercise that warrant attention.

The first relates to the fact that these students did not feel a sense of belonging within the institution. Even though these students were doing a certificate programme offered by the university, and ten of the group of eleven had to be physically present on the university campus on a weekly basis, one did not get the impression that they saw themselves as members of the university community.

This disconnectedness between the students and the institution was evident when they (the students) needed to find space for their own privately-arranged group study. They were not aware of any room that they could use for this purpose on the campus. In one instance, I allowed members of Group B to use my office after I had completed the interview with one of them. On another occasion, a member of Group A arranged for the interview to be held at her home, after which other members of the group were to join her to discuss a course assignment. Students seemed to feel alienated from the university and this may have contributed to the initial lack of enthusiasm that

Group A displayed for the research study.

My own schedule for both the survey and the observation study also presented its own problems. It was towards the end of the third and final semester of on-line teaching in the Certificate of Education that I embarked on the observation study. At that time, these students were looking ahead towards two important course-related activities: at the end of the semester they were required to submit a major assignment and in the fourth semester there would be the Practicum and the Study. In fact, Group A students had already started planning for these projects.

Deciding on the appropriate time for entering the fieldwork environment is not necessarily a clear-cut issue. While acknowledging the disadvantages of my schedule, undertaking either the survey or the observation study too early may have meant that students would not have 'matured' enough in their current teaching-learning situation. In fact a possible advantage of my schedule was that I was engaging with the students at a time when they had already accumulated much experience as learners in the current programme. Such a situation would very likely have increased the probability that any manifestation of behaviour or attitude would be substantially derived from this experience.

Notwithstanding the above, my main reason for entering the fieldwork environment at the relatively late stage of the latter part of the third semester, was my own lack of preparedness to do so at an earlier time. I needed to spend time refining the research focus before undertaking the study. However, the time spent clarifying research objectives was ultimately beneficial: the fact that I was able to adjust my initial research plan in light of the problems that arose, without compromising the research process, could be attributed to the clarity of the objectives informing the process.

Data analysis for observation study

There are six (6) subsections in this section of the chapter. The first outlines the activities that I engaged in as I analysed the data. The second provides an overview of the two tools used in analysing the data, namely the interpretive framework and selected aspects of discourse analysis. In the third subsection, I describe the framework, and in that context I highlight key features of two existing frameworks that influenced the creation of my own. The fourth subsection is devoted to a description of critical features of discourse analysis that were drawn on to develop this second analytical tool. A segment of data is also analysed to demonstrate the application of the variant of discourse analysis used here. The last two subsections respectively provide a brief description of the transcription format used and an explanation of frequently used terms in the data analysis.

Overview of the data analysis process

I began the first stages of data analysis during the fieldwork period. I retained the services of two assistants who transcribed and word processed the interview data. I also began my own preliminary analysis of the video data, mainly for the purpose of formulating interview questions. I verified the transcripts of the interview data by checking the wordprocessed documents against the audiotaped material. I ascertained my own transcription of the video data by reviewing the videotapes several times.

On my return to the UK, I continued working on the video data. This involved two simultaneous functions. At one level, I was transcribing the data, and at another I was identifying and coding elements in the data in accordance with the research objectives. In transcribing the data, I paid attention to both the verbal and non-verbal input of the student-participants and the verbal input of the lecturers. I omitted information that was not relevant to the teaching-learning processes. For example, I excluded discussions about administrative matters. I also excluded the contributions of students from other sites except where I considered these relevant to the understanding

of the input of the participants of the study. I was also forced to omit sections which, because of transmission problems on the audio-conferencing system, were not clearly audible on the videotape.

Subsequently I began identifying *episodes* in the data that I was transcribing and, using the codes that I had already defined, prepared short analyses of these segments. I did a short presentation of my analysis of select episodes at an in-house conference held during this period of my work.⁷

The process of transcribing, coding and identifying episodes resulted in the generation of categories and, based on these categories, I developed the interpretive framework to which I referred above. This transition from analysis of episodes to the creation of categories meant that more attention was being paid to detailed analysis of the data. In classifying aspects of the data within the categories, I was focusing on small units of meaning as the element to be analysed according to the attributes of the respective categories. These small units were ultimately recognised as the *units of analysis*, as will be discussed later.

At this juncture, I presented a paper at a work-in-progress seminar, describing the framework and outlining the rationale for setting it up.⁸

Out of this process of defining and setting up categories, there emerged issues related to the phenomena of knowledge-building and control. I combined these issues into two subsidiary research questions and used these questions to guide my further analysis of the data. Overall, I was dealing with the data at two levels: at the level of the episode and at the level of the unit of analysis.

The analytical tools

Qualitative research methods were used for the data collection aspect of the study with its emphasis on direct observation of the phenomenon in its real-world setting. The qualitative perspective also informed data analysis. Specifically, the

⁷ Conference of Student Research Centre/Institute of Educational Technology, 11 Oct., 1995.

⁸ Work-in-Progress Seminar, Institute of Educational Technology, 15. February, 1996.

emphasis was on using tools of analysis that would facilitate the emergence of meanings from the data.

At the same time, it must be noted that the decision to undertake the research study itself grew out of prior notions about the phenomenon being studied. Thus while maintaining a position that findings will emerge, it was recognised that the emergent meanings were themselves influenced by these previously held beliefs (see also Chap. 2, Miles and Huberman, 1995).

The data analysis tools were therefore based on a combination of deductive and inductive methods. This combination was evident in the construction of the interpretive framework. It was also evident in the extended analysis of the selected episodes which was based on discourse analysis principles on the one hand, and on the other, was guided by the framework mentioned above.

The interpretive framework

The conceptualisation and construction of the framework drew on two existing ones encountered in the literature. To a lesser extent Cookson and Chang's (1995) Multidimensional Audio-conferencing Classification System (MACS) and more significantly Henri's (1992) Framework for Content Analysis provided important insights regarding the design and application of this tool.

Existing frameworks

Cookson and Chang describe the MACS as "an instrument appropriate for the tabulation, analysis and interpretation of audio-conferencing instructional interactions" (p.18). MACS comprises five components namely *instructional interpersonal interactions*, *source of communication*, *target of communication*, *instructor/participant responses to distance*, *instructional procedures*, and these are further subdivided into dimensions, each with its own related set of behaviours (see Chapter Four of this thesis). My own assessment of MACS is that, while it represents an important development in the design of tools for the examination of learning in the environment of

the telecommunication technologies, it seeks to address too many elements within the single framework.

Henri (1992) expresses a similar interest in analysing learning in a CMC environment. He proposes the Framework for Content Analysis which he describes as "an appropriate analytical method that would identify the learning processes and strategies selected or developed by learners" (p.121). Henri's Framework comprises five dimensions, namely the *participative*, the *social*, the *interactive*, the *cognitive*, the *meta-cognitive*. These are all described in Chapter 4.

While both tools more or less cover similar aspects of the learning environment, the categories of Henri's Framework are more clearly defined and articulated and, as a result, handle the complexity of the environment more efficiently. My own study therefore draws on Henri's Framework for Content Analysis.

Relevant attributes of Henri's Framework

This Framework embodies certain features which I also consider important in the analysis of learning:

1. It treats learning as a process rather than as a product. In Henri's own words, the Framework is intended to highlight "what and how the learner understands, rather than what should have been understood" (p.123).
2. While highlighting the functions of the learner, it caters for the examination of both teaching and learning processes and consequently redresses the imbalance in other discussions that tend to focus exclusively on learning.
3. Unlike earlier frameworks, and in particular Flanders' Interaction Analysis Categories (Flanders, 1970), this framework is not role-specific: there are no teacher categories as distinct from learner categories. By extension, it is not inherently biased towards messages from either participant. For example, in the cognitive dimension, attributes of the subskill '*elementary clarification*', are described as 'identifying relevant elements', reformulating a problem', 'asking a

relevant question'. It is only when these descriptors are applied to the data that role distinctions would emerge. In my view, this feature of not specifying roles in the framework allows for a more inclusive conceptualisation of teaching and learning and brings the learner into greater focus than is possible in a framework that separates the roles.

4. The definition and analysis of the cognitive dimension are particularly relevant in relation to my own study. The author's treatment of this dimension is significant in its recognition of different levels of cognitive or knowledge-building activity, ranging from elementary clarification through to judgement and implementing strategies. Also of interest is the attention paid to depth of information processing.
5. The Framework is also significant in its interpretation of content analysis as a qualitative rather than a quantitative analytic tool. Except for the participative dimension which generates information about number of messages and duration of on-line connection, the others are all geared towards the generation of descriptive information as revealed through the content of the messages. As noted in Chapter Four, Henri's objective is to provide a tool that is capable of looking "beyond the surface meaning of the exchanged messages" (p.118).
6. In light of (5), the definition of the unit of analysis is very appropriate. Henri recognises that a whole message would be too complex to serve as a unit for the purpose of analysis. Consequently he states that the unit of analysis would be the smallest unit of meaning within a message capable of being categorised according to one or other of the five dimensions. This definition of the base unit in terms of its meaning rather than as a numerical entity, complements the qualitative characteristic of the overall tool as described above.

Aspects not relevant.

I share Henri's perspective in all the features described above and drew on all of them in designing my own framework. At the same time there are three areas in which the Content Analysis Framework differs from the one developed for this study.

First, Henri excludes the subject matter component from the Content Analysis Framework on the grounds that such a focus would be directed towards the product rather than the process of learning. Specifically he contends that a first level analysis of the data deals with "what is said on the subject or theme under discussion" and this he considers to be "the 'product' of learning". The other two levels, namely how the content is said, and the processes and strategies that learners adopt as they deal with the subject, are considered as revealing "more of the process of learning". Thus, he concludes, "... we have chosen to use [the latter two] to establish the framework of content analysis" (pp.123, 124).

While acknowledging the connection between content and the outcome of learning, it can be said that the treatment of content is an aspect of the process of learning and that, in research on teaching and learning, there is room for the examination of cognitive processes in the context of, rather than independently of a given knowledge domain. Specifically, my own framework was designed to illuminate teaching-learning processes as these were revealed in the manipulation of knowledge in a teacher education programme.

There is also the issue of control. Even though communication is the basis of the teaching-learning relationship, and control is an inherent factor in all communication, Henri does not highlight it as a component in its own right. Nonetheless it is implied. For example, link phrases identified within the interactive dimension can be expected to give some indication of the control position of the individual participant. A phrase such as 'As we said earlier' would very likely be used by someone who, at that point in the exchange, considers himself or herself as having the status to make statements that are projected as if they are shared by all participants.

This aspect of control is more apparent in Flanders' (1970) classification even though here too it is not made explicit. The objective of Flanders' Interaction Analysis Categories (FIAC) is to investigate the balance between initiative and response in classroom interaction and it is evident that issues of control are inherent in such an investigation. For example, categories labelled 'expressing own ideas' and 'justifying authority', obviously point to a speaker who occupies a dominant position in the interaction, at least at the point of speaking. Conversely, the category described as 'providing a response that has been solicited', will apply to a participant in a subsidiary position. My own view is that the control dimension must be made explicit and this was reflected in my framework.

Thirdly, unlike the Content Analysis Framework which was designed to facilitate analysis of a range of facets of the learning environment, my framework focused on what, in Henri's tool, is labelled as the cognitive dimension, and I examine control as it is revealed in relation to cognitive activity.

An additional difference between the two lay in their respective uses. Henri developed a tool that practitioners would use in the analysis of their own teaching-learning experiences. It was therefore intended for wide use. Mine was not intended for this purpose. Rather I developed mine as a means of setting the boundaries of the data of my own study and consequently to facilitate my interpretation of these data.

Finally, Henri's tool is partially medium-specific and some of the dimensions can only be applied in the environment in which the tool was developed. For example, the participative dimension is intended, in part, to provide information on the length of time a participant is on-line in the computer conferencing environment. While my study was conducted in an audio-conferencing environment, the framework itself was not medium-specific.

Constructing the framework

Overall, my framework embodied the following seven features:

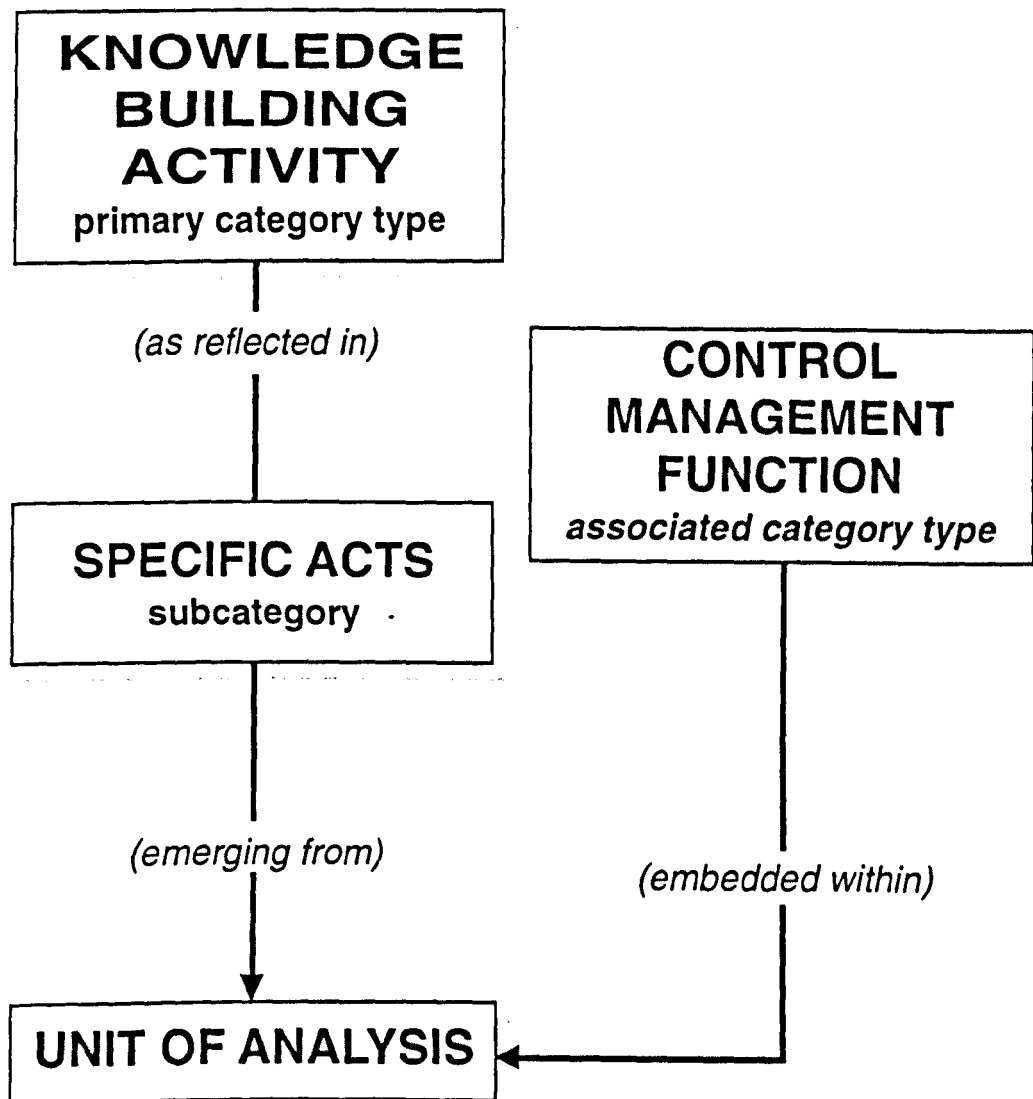
1. It was intended to facilitate a qualitative analysis of teaching-learning processes.
2. It catered for an examination of both teacher and student roles, while at the same time highlighting the latter.
3. The functions around which the framework was built were not role-specific.
4. It focused exclusively on the cognitive or knowledge-building aspect of the teaching-learning interaction.
5. It catered for the identification of control management functions in association with knowledge-building activities.
6. It was developed to reflect teaching and learning within the context of a specific knowledge domain.
7. It was not medium-specific.

The framework was constructed on two category types. One type was labelled *knowledge-building activity* and referred to the collective of communicative acts that teacher and student engaged in, and which were regarded as feeding into or revealing learner-knowledge interaction. One notes that, in its essential meaning, the term 'knowledge-building' or 'knowledge construction' can only apply to a function carried out by a learner. However, in the context of this study, it was used to apply to acts performed by both student and teacher that were aimed at facilitating change in the students' knowledge base. Precedent for this type of meaning extension can be found in Laurillard's description of the Conversational Framework which is built around the discourse of both teacher and student but which is presented as a model of the learning process.

The second category type was labelled *control management function* to refer to the group of strategies employed by the participants on either side of the teaching-learning divide, to define their positions relative to each other in a given interaction and as they sought to assert, accept or not accept the authority of the knowledge claims being made. What became evident was that the functions associated with this latter type occurred in conjunction with the knowledge building type within the discourse. The relationship between the two category types is illustrated in Figure 7.2.

Both category types were formulated out of a combined deductive/inductive process in which previously held notions exerted some influence on the emergence of themes from the data being analysed. It was in the unit of analysis that attributes of both category types were revealed.

Fig: 7.2
The Interpretive Framework



Unit of analysis

Drawing on Henri's definition, the unit of analysis was recognised as the smallest unit of meaning in the data consistent with or at least related to the attributes of the two sets of categories. As Henri himself emphasised, a complete statement or message of a participant may embody functions related to more than one category type. In a similar vein, I also acknowledged that a single statement may contain several such units.

The unit of analysis was recognised in both verbal and non-verbal messages. In its verbal form, it was identified in messages made on-line, in the public domain of the teaching-learning interaction as well as those made off-line by students either to themselves or in private exchange with one another. In its non-verbal form, it was recognised in the actions, gestures and other forms of body language of the students once these were considered meaningful in the context of the official discourse.

Categories identified

The following were identified as categories of the knowledge-building type:

1. Setting the objective of the interaction.
2. Information-transmission reception.
3. Planning for the implementation of new methods.
4. Problem-solving
5. Higher order examination of course content.

Each of these categories was further divided into subcategories.

The control management categories were,

1. Establishing control.
2. Maintaining control
3. Gaining control

4. Operating under control.
5. Breakdown of control.

In identifying the core attributes of both the categories and subcategories, and in labelling them, I not only relied on meanings generated from the data but also drew on related theoretical information from the literature. This procedure is consistent with the deductive-inductive approach referred to earlier.

In naming the knowledge-building categories and subcategories, I drew on Carter's (1985) taxonomy of objectives for professional education and in particular on his classification of skills. Carter makes a distinction between knowledge and skills. The former he defines as 'what the student knows' and the latter as 'what the student can do' (p.137). Given my stated objective to focus on the process rather than on the product of learning, it was the skills dimension of the taxonomy that informed the labelling exercise.

Carter identifies four types of skills, namely information skills, mental skills, action skills and social skills. Only the first three are relevant to the purposes of this study. He says that information skills deal with the handling of factual knowledge. Mental skills refer to the student's competence in manipulating knowledge and generating new knowledge. Carter associates the competencies of knowledge manipulation and generation of new knowledge, with the higher levels of the cognitive domain of Bloom's Taxonomy, namely analysis, evaluation and synthesis (Bloom et al., 1956). He describes action skills as "those skills by which ideas are transformed into some sort of action" (p.142).. and subdivides these into manual skills, organising skills, decision-making skills and problem-solving skills. Manual skills he associates with the psychomotor domain and the other three action skills, with the application category of Bloom's Taxonomy (Table 7.3).

Table 7.3: Abbreviated version of Carter's taxonomy

Mental Skills	Information Skills	Action Skills
Organisation	Acquisition	Manual
Analysis	Recording	Organising
Evaluation	Remembering	Decision-making
Synthesis	Communication	Problem-solving

The knowledge building categories listed earlier are seen as reflecting attributes of all three dimensions of Carter's skills domain. Of special interest is Carter's inclusion of action skills that are specifically applicable to professional practice and education. I see the third and fourth categories of my framework, namely planning for the implementation of new methods and problem-solving, as being aspects of this dimension.

The naming of the control management categories reflected Fairclough's perspective of power in the discourse and specifically his assertion, stated earlier, that "whether one is talking at the level of the particular situation, or in terms of a social institution or in terms of a whole society, power at all these levels is won, exercised, sustained and lost in the course of social struggle" (p.68).

I also saw my own categories as giving explicit form to functions embedded within Flanders' ten-category system. While I do not subscribe to Flanders' rigid and unbalanced separation between teacher and student categories, I maintain that the ten, taken as a whole, are representative of different control positions as the respective participants in the interaction engage in talk for initiating or responding to communication. The FIAC also includes a category to record silence and confusion which is reflected in my fifth category, breakdown of control.

It is on these two sets of categories that the Interpretive Framework was constructed.

Classifying data within categories.

The technique of content analysis, similar to that used in Henri's Framework, was used to classify the data within the categories previously established. I followed the

procedure outlined by Goetz and LeCompte (1984) who explain it in this way:

Central to categorisation is the generation of the properties and attributes that the data units of a category share. Data are amassed and scanned through systematic content analysis. Properties of a category are discovered by listing how all units are alike and how they differ systematically from units outside the category. Core properties are then used to develop an abstract definition of the category. (p.170)

The strategies that I adopted for doing content analysis in this study were consistent with the above explanation. These are explained below.

Establishing membership of a unit of analysis within a given category or sub-category was an important aspect of this content analysis exercise. To do this I paid special attention to linguistic features in the unit, be they syntactic, semantic or lexical as they revealed properties consistent with the definition of the relevant category or sub-category. For example, based on the definition of the sub category *formulating the problem-solving task*, a typical unit should contain a description of the problem situation and a question asking for a solution to the problem described. A unit was recognised as belonging to this sub category if these two components were detected within it. Similarly, in recognising the statement 'It is important that we look at the theory ...' as a member of the sub-category *making recommendations*, attention was drawn to the phrase 'it is important', itself a stock expression that is used when prescribing behaviour that is considered appropriate.

Sometimes it was necessary to use juxtaposition to highlight category-specific properties of the unit of interest. For example in the control management category labelled *maintaining control*, the point was made that one way in which a participant could be seen achieving this goal, was in the use of terms that reflected the speaker's authority in relation to the knowledge claims she was making. Thus one speaker was heard saying,

When it comes to the task ... this is where I scale the activity, this is where I discriminate.

To highlight the sense of authority emerging from this statement, the statement itself was juxtaposed against another dealing with the same topic but which did not contain elements that conveyed a similar sense of expertise and authority. The other speaker had said,

I let those who can cope work on their own and the ones that have problems, I work with them.

The contrast between the very focused 'I scale' and 'I discriminate' on the one hand, and the vague and imprecise 'cope' and 'work' on the other, was expected to reinforce the position taken that the first statement contained elements consistent with the function of maintaining control while the second did not.

In some instances, it was necessary to define one category in a manner that clearly distinguished it from another, given apparent similarities noticed in some of the units of analysis associated with each. For example, it was considered important to establish that a key defining feature of the *information-transmission* category was that the units within the category did not contain any readily identifiable elements aimed at engaging either speaker or listener in any observable act beyond those directly related to conveying and receiving the message. It was considered necessary to include this detail given the occurrence of units dealing with the same topic but performing different knowledge-building functions. Thus the statement

Checklists are particularly useful when they are combined with other kinds of data

would be classified as information-transmission, because it was not intended to engage anyone in any observable act. On the other hand, the statement,

I would like you to think of your own situation and tell me ... the specific things you would use [a checklist] for

was seen as contributing to the definition of the category *Planning for the implementation of new methods*, rather than *information transmission-reception*. The

approach taken above was expected to clarify category or sub-category boundaries and thus minimise the probability of peripheral blurring or overlap.

Units of analysis were therefore identified and classified using the procedures outlined above.

Accounting for category reliability.

In some sectors of the research community, intercoder reliability is considered necessary for establishing the reliability of categories identified (Miles and Huberman, 1995,p.64). This procedure was not used in this study for the reasons outlined below.

First, it is usually the case that this procedure is implemented where categories are to be used to generate quantitative data in support of research aimed at hypothesis testing. The aim of this study was to describe and analyse behaviours and not to test a pre-established hypothesis.

Secondly the framework designed was not intended for use beyond this study. Unlike Henri's tool, mine was specifically constructed to facilitate data analysis within this study. Thus I did not consider it necessary to take steps that are no doubt required if that type of replicability is intended.

My principal concern regarding the use of this framework was that it should be able to meet appropriate standards of internal and external consistency. The strategies for classifying data within the categories as described above were aimed at attaining the former and the use of Carter's taxonomy of objectives in defining and labelling the categories was intended to meet the requirements of the latter.

All of the above informed the construction of the interpretive framework which will be described fully in Chapter 9.

Extended data analysis

The process of setting up the categories also entailed the identification of issues that were themselves in the data and which I thought should be addressed in greater detail. Consequently, at the end of the category-building exercise, I combined this

series of issues into two subsidiary research questions. It is these questions that guided the subsequent analysis.

The episodes which were also constituted from within the data and which I described earlier, provided the forum for this extended data analysis. As noted earlier, the procedures adopted at this stage of data analysis involved a combination of the interpretive framework and selected aspects of discourse analysis. The two sets of categories of the framework set the boundaries within which the analysis was conducted and the strategy derived from select aspects of discourse analysis, served as the tool for detailed analysis of the data.

Using discourse analysis

The work of two sets of theorists informed this aspect of the data analysis for the observation study. Potter and Wetherell's (1987) perspective on discourse provided the basis for the strategy adopted. These writers take the view that language is action-orientated and that people use it to do things. It is this interpretation of language that they refer to as discourse. They explain further that the term 'discourse' covers "all forms of spoken interaction, formal and informal, and written texts of all kinds (p.7). Based on this understanding of discourse, they propose an approach to discourse analysis, that involves the analysis of three interrelated components within the discourse, namely *function*, *variation* and *construction*.

With regard to function, they affirm that it incorporates two perspectives on language use. At one level it refers to the actual things that people do with their discourse, for example making accusations, asking questions, justifying conduct. At another level, they emphasise that it entails the unintended consequences that emerge from language use even when the discourse is not specifically formulated for that purpose. In this regard, the writers talk of a continuum of functions, ranging from the 'interpersonal' (such as explaining, justifying) to those that are seen as "having a particular kind of ideological effect in the sense of legitimating power of one group in a society" (Wetherell and Potter, 1988, p.169).

They note that functions are not always readily identifiable in the discourse and that it is through the study of variation that they are revealed. They contend that "what people say and write will be different according to what they are doing", and that "speakers give shifting, inconsistent and varied pictures of their social worlds" (1988, p.171).

Thirdly, they advance the view that people use discourse constructively. Language is put together, that is, it is constructed to achieve particular consequences. They explain further that their use of the term 'construction' implies that discourse is manufactured out of pre-existing linguistic resources, that it involves active selection from among these linguistic resources and that it has practical consequences. Thus they conclude that "discourse can be said to 'construct' our lived reality" (1988, p.172).

Fairclough's (1989) perspective on the link between language and power also contributed to the methodology for data analysis. This writer locates his conception of language and discourse within a clear societal framework and he defines discourse as "language as social practice determined by social structures". Underpinning this definition is his core thesis that "language is centrally involved in power" (p.17). For the purpose of this study, it is his notion of power in the discourse that is the focus of interest. As noted in Chapter 6, he explains that power in the discourse has to do with "powerful participants controlling and constraining the contributions of non-powerful participants". In this regard he specifies three types of constraints, namely constraints on the contents, what is said; on the relations, that is the social relations people enter into in a discourse; and constraints on the subject positions they can occupy. He states further that these constraints imply linguistic forms (p.46).

Fairclough also acknowledges the significance of the discourse type that is drawn upon during a specific discourse event or situation (see earlier explanation) and he suggests four key questions to guide the interpretation of the situation, which could also serve the function of identifying the discourse type(s) that is being drawn on. The questions are "What's going on, who's involved, in what relations, and what's the role of language in what's going on" (p.146).

My own extended analysis of the data was informed by the principles and practices outlined above. The following subsection has been included here to illustrate the application of the combined data analysis methodology described above. It starts with the presentation of an extract from one of the episodes, then continues with an analysis of the extract.

Analysing the data: an illustration

The following is the extract:

Student	How do you address levels? Like in a class, with say eight children at five different levels or five different topics in a particular subject. How do you address that?
Lecturer	One way of doing it, or, question (<i>pause</i>) Based on what things we have been doing for the past three, two and a half semesters, any ideas as to how you will deal with different levels? How are you dealing with different levels?

The analysis follows:

Based on the definition used in setting up the categories, most of the units of analysis within this extract contain attributes consistent with the problem-solving category. The student initiates the discussion by *formulating the problem-solving task*. In the context of this study, this knowledge-building activity comprises two parts - one, a description of the problem situation and the other, a question requesting a solution. The lecturer's incomplete opening remark, "One way of doing it", suggests that she is about to *outline a solution*, but has decided against it. Rather, she re-formulates the problem-solving task, re-directing it to the student.

This specific discourse event draws on two discourse types that are characteristic of this setting. The first is the **request** that the student makes of the lecturer. In this formal education setting, students are usually the ones who use this discourse type. There is something which they require but which they are unable and/or unwilling to provide for themselves.

The second, used by the teacher, is the **guided discovery method**. In the teaching-learning setting, teachers are always the ones in control of this discourse type.

It is an inherent part of the role that the institution has conferred on them. They may or may not use it but what is certain is that students do not have the right to initiate its use. Rather students' participation in this type of discourse is always determined by the teacher.

Within this problem-solving category, there is evidence that the lecturer is using her language for two apparently similar but probably very different functions. These functions are embedded in the two questions that she poses, namely "Any ideas as to how you will deal with different levels?" and "How are you dealing with different levels?" At a surface level, these two questions seem to be performing the same function. However, when the introduction to the first question is included ("based on what things we have been doing for the past three, two and a half semesters"), a different picture emerges.

Through the introductory statement preceding the first question, the lecturer is reminding students of work covered in the preceding semesters. It is likely that it is the lecturer's intention that students should draw on the pool of knowledge generated during that period, in order to answer the question she subsequently posed. Given what is known about the types of courses completed during those semesters, and given the nature of the student's request, one may infer that the lecturer is directing the student to use theory to inform practice.

On closer examination, the second question appears to be performing a different function and the stress on the 'you' reinforces the impression that a shift has taken place. By emphasising the 'you' the lecturer seems to have reduced the focus on the theory-practice link detected in the first question, and is now requiring the student to draw primarily on his own practical, experiential knowledge to address the problem. The theoretical dimension seems to have been pushed into the background and the lecturer seems to be directing the student more towards his knowledge as practitioner and less towards his knowledge as theoretician. Consequently, as the lecturer proceeds from one question to the next, variation in the function of the discourse is revealed through her use of language and specifically through her stress on the pronoun 'you'.

In formulating the initial problem-solving task, the student is initiating the discourse and thereby *establishing control* of it. What is worth noting though is that it is a fairly uncertain control position for, while this specific discourse event places him in a dominant position, dominance is not a feature of the role embedded within the discourse type. As a student, when one is making a request of a teacher, the teacher can reserve the right to determine whether or not to accede to the request. Consequently, as is the case in this extract, the student loses his dominant control position to the teacher as the latter demonstrates her power to alter the nature of the discourse, and in the process *gain control*.

Interestingly though, there is no hint of submission in the way the student puts the request. Both questions that he uses are very forthright and direct, suggesting a reasonable amount of self-confidence on his part. In fact it can be argued that his forthrightness almost succeeds in obtaining the response that he intended, namely a solution to the problem. The lecturer had actually begun formulating one but stopped herself from getting into the position where she would have been *operating under the control* of the student.

Finally, this discourse type allows the lecturer to hide the power that she is wielding. She does not need to state overtly that she will not provide a solution, and that the student must generate his own. The guided discovery method succinctly masks the nature of the power relations between the two.

What is evident from this examination is that knowledge building activities and control management functions occur simultaneously in the teaching-learning interaction with the latter underpinning the former.

The transcription format

Episodes from the transcribed data were included in the research report to allow for reader examination and verification of the findings and conclusions derived by this researcher. The original data were themselves transcribed verbatim from the video and audio recordings, except where technical or other environmental problems precluded

against this, as discussed earlier.

The following features were included in the episodes:

1. Punctuation was included based on the intonation of the speaker.
2. Italics were used to present information describing non-verbal communication or a participant's manner of speaking. This information was also included in parenthesis.
3. The word 'incomplete' was inserted at points where the speaker appeared not to complete an idea. 'Unclear' was used where a section was inaudible because of technical or other environmental factors. The word 'pause' was used to indicate a period of silence either within the talk of a single participant or between the talk of two participants. All these terms were written in italics.
4. Ellipsis points were used to indicate omissions. If the omission was an extended segment, a dotted line extending from the left to the right margin was used.
5. An abbreviated version of the participants' names was used to preserve their anonymity.

This format was intended to allow for optimum clarity while keeping as close as possible to the data generated.

Terminology

The words 'student', 'student-teacher' and 'learner' were used interchangeably to refer to the main participants of the study. The supporting participants, performing the teaching function, were referred to as 'lecturers' or as 'teachers'. The term 'pupils' was used to refer to the children whom the student-teachers taught in their regular classroom practice.

All of the preceding constituted the methodology that was employed for the implementation of this research programme.

CHAPTER 8

STUDENT TEACHERS' PERCEPTIONS OF THEIR EXPERIENCE AS LEARNERS

Introduction

This is the first of four chapters that deal with the analysis of the data generated from the two sub-studies whose methodologies were described in the preceding chapter. This chapter focuses on the exploratory survey. It begins with a brief overview of key features of the methodology, then it presents the findings and the discussion.

The exploratory survey was conducted to address the question, "How do student-teachers perceive their learning experience in a formal education environment?". Specifically, it was intended to examine student-teachers' perceptions of their roles and expectations as individual learners and in their relationship with their teachers (lecturers) and fellow students. Three subtests were developed to address this issue.

The first of the three was entitled Talking with Lecturers and was based on the concept of 'dialogue' (e.g. Modra, 1991). The second Which settings are most useful for which learning tasks? was intended to examine students' perceptions of the usefulness of different groupings for a range of learning tasks. It was developed out of selected attributes of collaborative learning (e.g. Gunawardena, 1991). The third Taking responsibility for your learning, was aimed at investigating the extent to which learners saw themselves as being capable of managing their learning experiences. It was based on Garrison and Baynton's (1987) model of learner control.

The survey was administered to student-teachers pursuing the postgraduate Diploma of Education at the Faculty of Education, UWI, St. Augustine, Trinidad.

Findings

The findings of the three subtests will be presented separately.

Subtest 1: Talking with lecturers

This subtest comprised 14 closed items and was aimed at determining students' perceptions of the nature of their relationship with their lecturer. The items themselves would measure how frequently students perceived themselves engaging in reactive and proactive communication respectively with their lecturers. On a scale of 5 to 1, 5 indicated 'very often' and 1, 'never'.

The results of this test indicated that respondents saw themselves as engaging more frequently in reactive than in proactive communication with their lecturers. The mean on the items representing *reactive* communication was 3.33 with a standard deviation of .48. The mean for *proactive* communication was 2.41 with a standard deviation of .52.

A distinct pattern was evident in the responses to each of the two types of communication. The number of respondents selecting the 'very often' rating for the reactive group of items was noticeably larger than the number selecting the same rating for the proactive group of items. At the other end of the scale, the pattern was reversed with more respondents opting for the 'never' rating for proactive communication.

For example, approximately 11% gave a 'very often' rating for the *reactive* item 'You answer questions that lecturers ask' while 3% gave this item a 'never' rating. On the other hand, only about 1% gave the highest rating to the *proactive* item 'In a group setting you openly disagree with lecturers' views on some aspect of the course' with 12% recording a 'never' rating for this item.

There was one item where this pattern in the rating of proactive and reactive categories did not always appear to apply. About one percent (1%) of respondents gave the highest rating (very often) to the item, 'With other students, you recommend changes to the programme study', which fitted the response rate pattern for proactive

communication in this, the highest rating. However some 21% gave the item the second highest rating, 'often', and this was considered atypical for an item that was designed as an example of proactive communication. On reflection, it is likely that a substantial proportion of the respondents treated this item as an example of reactive communication. Very likely, they interpreted it as a request to the authorities from subordinates rather than as a demand from a group asserting their rights. Thus they did not consider it as belonging to the same (proactive) category as, for example, the item which stated, 'In a group setting, you openly disagree with lecturers' views on some aspect of the course'. This latter item only received about 7% for the 'often' rating. The unexpected behaviour of the one now being examined would no doubt have been detected and dealt with had the instrument been pilot tested and item analysis conducted.

It is worth noting though that the majority of respondents tended towards the 'sometimes' rating for both reactive and proactive items, a feature which also raises questions about the reliability of the subtest. It is likely that this subtest was not sufficiently discriminating (Table 8.1).

Table 8.1: % frequency distribution for selected items of Subtest I

ITEM CATEGORY	ITEM	RATING SCALE					
		Very often	Often	Some- times	Rarely	Never	No resp.
REACTIVE	You support a point made by a lecturer.	6.7	24.0	57.3	12.0	-	-
	You answer questions that lecturers ask.	10.7	30.7	48.0	8.0	2.7	-
PROACTIVE	In a group setting you openly disagree with lecturers' views on some aspect of the course.	1.3	6.7	46.7	33.3	12.0	-
	With other students you recommend changes to the programme of study.	1.3	21.3	40.0	22.7	14.7	-

n = 75.

Subtest 2: Which settings are most useful for which learning tasks?

As mentioned in Chapter Seven, the five settings with their codes were,

1. individual studying alone.
2. individual with one or two other students.
3. individual on one-to-one basis with lecturer.
4. small group session (15 or less) - students only.
5. small group session (15 or less) - students with lecturer.

Because of the absence of responses for code No. 6 (None of the settings), this was eliminated from the analysis of the data.

The four broad categories of learning tasks were,

1. studying the course content,
2. project work,
3. assignment-related tasks,
4. activities related to the affective domain.

Respondents were required to indicate their choice of most useful and least useful respectively from among the five settings in relation to each of the learning tasks listed. They were to think about each of twenty learning tasks and indicate which of the five settings was most useful and least useful respectively for carrying out each task.

Overall pattern of choice of settings for all learning tasks

In relation to all learning tasks taken together, no single setting emerged as the dominant *most useful* setting. This descriptive was applied in fairly equal proportions to three of the settings, namely individual with one or two other students, (setting 2) individual on one-to-one basis with lecturer (setting 3), and group with lecturer (setting 5). By contrast, one setting, namely the individual studying alone (setting 1) stood out as the one most frequently selected as the *least useful* for all types of tasks (Table 8.2).

Table 8.2: Overview of most and least useful settings for all four categories of tasks (% to nearest whole number).

TASKS	SETTINGS									
	no resp.		1		2		3		4	
	Mst.	Lst.	Mst.	Lst.	Mst.	Lst.	Mst.	Lst.	Mst.	Lst.
All categories	6	11	11	54	23	3	23	5	13	13
			24	14						

SETTINGS:

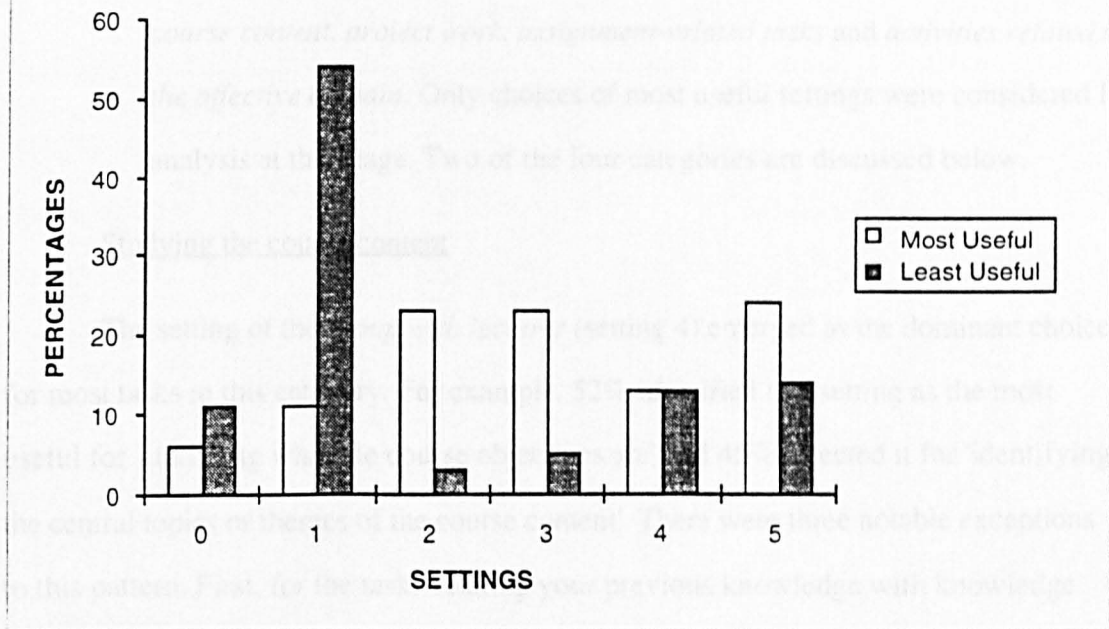
1. individual studying alone
2. individual with one or two other students
3. individual on one-to-one basis with lecturer
4. small group session (15 or less) - students only
5. small group session (15 or less) - students with lecturer

Mst. = most useful setting

Lst. = least useful setting.

Also of interest with regard to the choice of settings for all tasks, is that the individual with one or two other students (setting 2) and on a one-to-one basis with the lecturer (setting 3) can be regarded as highly favoured when the relatively high proportion of *most useful* choices are viewed against the relatively low proportion of *least useful* choices that each of these two settings received. It is also worth noting that the pattern emerging for the group (15 or less) without a lecturer (setting 4) is evenly balanced between the two conditions of most and least useful, whereas there is a greater disparity in the case of the group (15 or less) with a lecturer (setting 5) (Figure 8.1).

Figure 8.1: Display of choice of settings for all tasks



SETTINGS:

- 0 no response
- 1. individual studying alone
- 2. individual with one or two other students
- 3. individual on one-to-one basis with lecturer
- 4. small group session (15 or less) - students only
- 5. small group session (15 or less) - students with lecturer

The pattern emerging for all task categories taken together was that there was limited variation in terms of the settings considered *least useful* for performing these tasks. Specifically, the 'individual studying alone' was identified most frequently as the least useful setting for all tasks taken collectively. It was therefore evident that this imbalance would be repeated at the level of the separate categories. Consequently the least useful data of this subtest were excluded at the stage of analysis of the separate categories.

Choice of settings for separate task categories

The four categories of learning tasks as listed earlier were *studying the course content*, *project work*, *assignment-related tasks* and *activities related to the affective domain*. Only choices of most useful settings were considered for analysis at this stage. Two of the four categories are discussed below.

Studying the course content

The setting of the *group with lecturer* (setting 4) emerged as the dominant choice for most tasks in this category. For example, 52% identified this setting as the most useful for 'clarifying what the course objectives are' and 45% selected it for 'identifying the central topics or themes of the course content'. There were three notable exceptions to this pattern. First, for the task, 'relating your previous knowledge with knowledge you are now acquiring', there was a clear preference for the *individual studying alone* (setting 1). Secondly, when having to deal with various kinds of difficulties, respondents tended towards the *individual on a one-to-one basis with the lecturer* (setting 3). This was the case for the tasks, 'Seeking explanations for aspects of the content you are unclear about' and 'Seeking clarification for something you did not understand in your readings'. Thirdly, even though the *group with lecturer* was most selected for the task, 'discussing issues arising from your readings', the setting, *individual with one or two other students* (setting 2) was also considered to be a most useful setting for this task by a substantial proportion of the respondents. (Table 8.3)

Table 8.3: Choice of most useful settings for 'Studying the course content' (% in brackets)

TASK	SETTINGS						TOTAL -ALL SETTINGS
	no. resp.	ind. alone	ind. with 1/2 others.	ind. with lect.	group w/out lect.	group with lect.	
Clarifying what the course objectives are.	1 (1.3)	2 (2.7)	9 (12)	19 (25.3)	5 (6.7)	39 (52)	75 (100)
Identifying central topics or themes of the course content.	1 (1.3)	4 (5.3)	15 (20)	13 (17.3)	8 (10.7)	34 (45.3)	75 (100)
Seeking explanations for aspects of the content you are unclear about.	2 (2.7)	2 (2.7)	11 (14.7)	42 (56)	4 (5.3)	14 (18.7)	75 (100)
Making links between theory and real world experiences.	4 (5.3)	10 (13.3)	11 (14.7)	5 (6.7)	17 (22.7)	28 (37.3)	75 (100)
Relating your previous knowledge with knowledge you are now acquiring.	4 (5.3)	34 (45.3)	13 (17.3)	3 (4)	10 (13.3)	11 (14.7)	75 (100)
Seeking clarification for something you did not understand in your readings.	4 (5.3)	2 (2.7)	15 (20)	34 (45.3)	2 (2.7)	18 (24)	75 (100).
Discussing issues arising from your readings.	5 (6.7)	-	24 (32)	5 (6.7)	10 (13.3)	31 (41.3)	75 (100)
TOTAL TASK CATEGORY	21 (4)	54 (10.3)	98 (18.7)	121 (23)	56 (10.7)	175 (33.3)	525 (100).

Project Work

A substantial proportion of the respondents (33%) demonstrated confidence in their own individual capability (*individual studying alone*) to formulate plans for their own projects. However an almost equal number required the support of the lecturer (*individual with lecturer*) for this task. At the same time, one notes that 20% selected *the individual with one or two other students* for the same task, suggesting that a fair amount of these student-teachers felt that they could rely on their peers to contribute to their individual project planning. Thus three of the five settings were substantially represented in respondents' preferences for performing the task of project planning.

A somewhat different picture emerged if difficulties arise when the project is in progress. On such occasions *the individual with lecturer* clearly stood out as the preferred setting. Nonetheless, it is also worth noting that 27% showed a preference for the support of one or two of their peers (*individual with one or two other students*) for getting through these problems.

With regard to problems that arise from a class project, the pattern was somewhat different from the one observed for problems in an individual project. Three settings more or less received equal consideration from the respondents, with *the individual with one or two other students* as the choice for 25% of these student-teachers (Table 8.4).

Table 8.4 : Choice of most useful settings for project work (% in brackets)

TASK	SETTINGS						TOTAL -ALL SETTINGS
	no. resp.	ind. alone	ind. with 1/2 others.	ind. with lect.	group w/out lect.	group with lect.	
Drawing up plans for a project you are doing on your own.	3 (4)	25 (33.3)	15 (20)	26 (34.7)	2 (2.7)	4 (5.3)	75 (100)
Dealing with difficulties you encounter while doing your own project.	3 (4)	2 (2.7)	20 (26.7)	39 (52)	4 (5.3)	7 (9.3)	75 (100)
Negotiating roles for doing a class project.	7 (9.3)	-	8 (10.7)	2 (2.7)	39 (52)	19 (25.3)	75 (100)
Working through problems that come up while doing a class project	4 (5.3)	2 (2.7)	19 (25.3)	6 (8)	24 (32)	20 (26.7)	75 (100)
TOTAL TASK CATEGORY	17 (5.7)	29 (9.7)	62 (20.7)	73 (24.3)	69 (23)	50 (16.7)	300 (100)

Subtest 3: Taking responsibility for your own learning.

This subtest was aimed at operationalising Garrison and Baynton's model of learner control. It was subdivided into two sections. The first contained 12 closed items and addressed the issue of independence, one of the dimensions of the model. The second contained four open-ended items which were designed to explore the other two dimensions, namely power and support.

Section I: Independent learner activity

In responding to the items of this section, student-teachers were required to indicate how capable they considered themselves at performing specific independent learning tasks. On a scale of 5 to 1, 5 indicated 'capable' and 1, 'definitely not capable'. Students rated themselves very highly on almost all aspects of independent learning

activity. The mean on these items was 4.00 with a standard deviation of .82. When the 'fairly capable' and 'capable' categories of responses are combined, the following pattern emerges for the items below:

1. Sixty five percent (65%) response in these two ratings combined, for the item '(You can) set your own objectives, once given a topic and course outline';
2. Eighty five percent (85%) for '(You can) draw up a study program with the support of a lecturer';
3. Sixty eight percent (68%) for '(You can) decide how you want to be assessed' (Table 8.5)

Table 8.5 : Frequency distribution for selected items of Subtest 3 (%
only)

ITEM	RATING SCALE					
	Capable	Fairly Capable	Only just capable	Not capable	Def. not capable	No resp.
Given a topic and course outline. (you can) set your own objectives.	30.7	34.7	25.3	4.0	4.0	1.3
(You can) draw up a study programme with the support of a lecturer.	40.0	45.3	6.7	5.3	1.3	1.3
(You can) decide how you want to be assessed.	34.7	33.3	17.3	9.3	1.3	4.0
(You can) assume full responsibility for scheduling your study time.	52.0	30.7	9.3	2.7	2.7	2.7

n = 75.

Section 2: Personal power and support

In the second section, there were four open-ended items. The first two sought responses about personal strengths and limitations (power) and the second two sought responses on external facilitating and hindering factors (support). An examination of both sets revealed that responses given as personal strengths and external facilitating factors respectively were basically of the same type as the corresponding responses entered as personal limitations and external hindering factors. Consequently the same headings were used to categorise entries to each of the two sets of items.

Power

With respect to the dimension of *power* respondents were required to list 3 strengths and 3 limitations. Thus for the entire sample of 75 respondents, there was a total expected tally of 225 responses for each of these two items.

Eight attributes of personal power were identified from the responses to both items (Table 8.6).

Table 8.6 : Attributes of power

ATTRIBUTES	LISTED AS STRENGTH		LISTED AS LIMITATION	
	No. of Resp.	% of Total Responses	No. of Resp.	% of Total Responses.
Intellectual Skills, Abilities	39	17.33	15	6.67
Self-discipline qualities	50	22.22	19	8.44
Ability to manage learning	37	16.44	36	16.00
Self-motivation, self-confidence	11	4.89	7	3.11
Personal aspirations, attitudes to learning	25	11.11	9	4.00
Emotional, Spiritual Strengths or Limitations	7	3.11	4	1.78
Experience/Age	3	1.33	1	0.44
Physical Condition	-	-	4	1.78
Invalid Response	25	11.11	78	34.67
No Response	28	12.44	52	23.11
Total	225	100%	225	100%

The largest attribute groupings were intellectual skills and abilities, self-discipline qualities and ability to organise one's learning activities. The first two of these are described below.

Intellectual skills: The 39 responses entered as personal strengths in this attribute group represented 17% of the total responses for the relevant item and the 15 entered as personal limitations represented 7% of responses for that item. Out of the 39 intellectual skills grouped as personal strengths, there were 15 that can be described as being of the *acquisition, storage and retrieval* type. Examples of these were 'ability to organise and retain', 'ability to recall easily', 'capacity to read and understand'. There

were 5 responses of this type in the 15 intellectual skills listed as personal limitations. One example was 'difficulties in understanding certain reading materials'. It is worth noting that four of the five limitations in the *acquisition-storage-retrieval subgroup* were in the area of reading.

Analytic ability was cited as a personal strength five times. There was one reference to *concentration* as a strength and five references to it as a limitation. *Synthesis skills* were cited as a strength four times, for example 'I relate apparently unconnected material' and as a limitation once, namely, 'I fail to link subject matter with real life'. Other entries reflecting a higher level of intellectual activity included 'open to new ideas' (personal strength) and 'not to be able to trash out areas of difficulty as they arise' (personal limitation).

Self-discipline qualities: The 50 responses entered as personal strengths in this group represented 22% of the total expected responses for the relevant item and the 19 entered as limitations, 8%. Very evident in the 50 personal strengths in this group was the use of stock expressions. Variations of the terms 'persistent' and 'persevere' appeared 9 times; there were 7 instances of 'determination', 8 of 'discipline' and 3 of 'hardwork'. Other terms used were 'stick-to-it-iveness', 'endurance' and 'commitment'. On the other hand, within the 16 personal limitations of this attribute group, there was greater use of more descriptive and explanatory language such as 'involved in many activities', 'not wishing to lose control of other aspects of my life' and 'having just begun and having not studied for several years, need time to get back to intense discipline which studying requires'.

Invalid responses entered as strengths/limitations: The 25 invalid responses entered as personal strengths accounted for 11% of the total expected responses for that item and the 78 entered as personal limitations accounted for 35%. While this group of responses was not established as one of the eight categories referred to earlier, it is worth noting that invalid responses entered as limitations represented the highest single group of responses for the item on personal limitations.

These responses were considered inappropriate for the two items set since they tended to be more representative of factors outside the person rather than of attributes within the person. Examples of such responses entered as personal strengths were 'lecturers', 'guidance on topics with lecturer'. Examples entered as limitations were 'family commitments', 'distance between home and campus', 'not having relevant material' and 'too many perspectives, but not direction'.

Support

With regard to the two items on support, students were required to identify three facilitating and three hindering external factors for each of two items. Thus, as was the case with the items on personal power, there was a total of 225 expected responses for each of these support items.

Responses were grouped into 10 categories and the same categories applied for both facilitating and hindering factors. Family life and institution-related factors emerged as the dominant ones (Table 8.7). The second of these is described below.

Table 8.7: Facilitating and hindering external factors

EXTERNAL FACTORS	FACILITATING		HINDERING	
	No. of Resp.	% of Total Responses	No. of Resp.	% of Total Responses
Family-related	43	19.11	34	15.11
Institution-related	46	20.44	38	16.89
Relationship with fellow students	14	6.22	2	0.89
Environment (home, institution)	19	8.44	10	4.44
Distance, Time, Job responsibilities	11	4.89	37	16.44
Role, influence of acquaintances	22	9.78	8	3.56
Personal financial situation	-	-	12	5.33
Rewards	3	1.33	1	0.44
Effect of socio-cultural factors	3	1.33	8	3.56
Religion	4	1.78	-	-
Invalid Responses	9	4.00	9	4.00
No response	51	22.67	66	29.33
Total	225	100%	225	100%

Institution-related factors: These included the role and function of the lecturer, access to (non-human) resources, administrative factors, and the structure and delivery of the program of study. In relation to the lecturer, respondents found that 'listening to the lecturer' and lecturers who offered 'proper guidance and tutorship' were facilitating factors. 'Lecturers who are unclear' was regarded as a hindering factor.

The follow-up interviews provided more detail on this issue of desired lecturer-roles. In response to a question about learner expectations of lecturers, there was preference for a lecturer performing a very directive, information-transmission function. For example, one interviewee made the following comment:

I expect them to be able to explain the subject matter. Usually the text is not very clear. What you are looking for is simplification of things... I find that it (the lecture) provides a guide to me because some of the terms I might not understand and would find the explanation in the lecture... Basically the lecturer tends to point the student in the direction that is expected. This is what I look for.

Another held similar views. She stated,

As a student I expect him (the lecturer) to give me relevant information to whatever topic they may be discussing, concrete guidance as to exactly what they expect of me.

It must be noted though that interviews were conducted with students who had volunteered. Hence these responses cannot be regarded as being representative of the sample. Nonetheless it is very likely that students hold these expectations of their lecturers as a result of their being part of a rigid top-down teaching-learning environment.

Preference for structure and directiveness was also evident in respondents' views on the strengths and limitations of the study programme. The students noted the benefits of 'clear concise information', 'rundown on examination questions, format etc.' and the disadvantages of 'not being clear on assignments' and 'lack of proper directions'.

Negative responses: The high proportion of 'no responses' also deserves attention. One recalls that respondents were required to give three responses for each of the four open-ended questions in this subtest. However, most respondents failed to provide all three required responses for these two final open-ended items. It is likely that this requirement made this section of the questionnaire too long. It is also likely that respondents may have felt that they had exhausted all that could have been said on the topic.

Emergent Issues

Ambivalence

Based on the findings of the subtest Talking with lecturers, it would appear that relationships between teachers and learners tend to be more asymmetrical than symmetrical. However a large proportion of the student-teachers gave themselves a 'sometimes' rating for both reactive and proactive communication. As suggested earlier, this convergence towards the centre ground for all items of this subtest is probably an indication that the test itself was not sufficiently discriminating. At the same time, it may also be a reflection of the student-teachers' ambivalence about the exact nature of the relationship. These students, being practising professionals in their own right, are coming from situations in which they are used to taking the lead in communication. In their current situation as learners, they probably want to retain that right to be initiators, but at the same time, may be losing confidence in their competence to exercise that right.

If it is the case that this ambivalence indeed exists, one pertinent issue is, how does it manifest itself, in an actual teaching-learning interaction?

Preferred settings

When viewed from an overall perspective, the single dominant finding emerging from the data of the subtest, Which settings are most useful for which tasks? is that student-teachers have little confidence in their own capability to manage their own learning: they selected the *individual studying alone* most frequently as the least useful setting for all tasks taken together. However this single factor should not obscure other important aspects of these data. In this regard, a useful finding emerging from the data is that student-teachers favour different types of working arrangements depending on the nature of the learning task to be performed.

Where the study of the formal content is concerned, there is clear evidence that the lecturer role is highly desired. It is worth noting that the labels describing the two settings in which the lecturer is included does not specify how the lecturer would function. Consequently the data do not reveal whether the students expect any difference between the lecturer role in the group of 15 or less (setting 5) and that inherent in the one-to-one student-lecturer arrangement (setting 3). It is likely that these responses embody a complex of lecturer roles ranging from the more didactic to the more facilitative.

While settings that include the lecturer appear dominant in relation to tasks associated with the study of the formal course content, other types of settings are favourably considered for tasks in the other categories. Of special interest is the level of preference shown for the *individual with one or two other students* as an appropriate setting for clarifying and discussing readings, planning for the individual project, or dealing with difficulties while doing either the individual or group project. Indeed, this arrangement of two or three students working together seems to be favourably regarded by this group of students. It suggests that in spite of the strong hierarchical culture of conventional higher education, student-teachers value small group collaboration with their peers.

In addition, notwithstanding the overall negative rating for the individual studying alone, this setting is not completely without value as far as these students are concerned. It received a positive rating for both linking prior and current knowledge as well as for making plans for an individual project. This aspect of the data is interesting in particular since, in the context of collaborative learning, little or no attention is paid to the individual functioning outside of the group.

On the whole, while the notion of participants working in groups is the core feature of collaborative learning, there is no evidence that the issue of matching group types to types of tasks has been addressed in the literature. These data strongly suggest that this may be an important area of investigation.

Tension in self-definition

Data generated in the subtest Taking responsibility for your learning provide some degree of support for Garrison and Baynton's model of learner control. In particular attributes of power (personal strengths and limitations) and support (external facilitating and hindering factors) outlined by the students themselves, parallel those presented in the theoretical model. However Garrison and Baynton also emphasise the importance of balance among all three components. They contend that "for the student to have full control over the learning situation, there must be a dynamic balance between independence, power and support" (p.9). Based on these data, it is doubtful whether this balance has been attained by this group of learners. One wonders whether the attributes of personal power and the examples of external support factors cited in the study are sufficiently appropriate to complement the level of independence for which students deemed themselves capable. Four aspects of the data suggest that this may not be the case.

First, it is unlikely that the preferred role of the lecturer as identified by some members of the group can adequately serve as a support for learner control as conceptualised by Garrison and Baynton. These writers caution against the type of human support that "manages, controls and directs the interaction" (p.8). What is evident in this survey, both in the responses to the open-ended questions and in the follow-up interviews, is a situation where at least some learners are articulating a need for a lecturer-figure that manages, directs and controls.

Secondly, although there is some awareness of the role of higher order mental activity, there is a heavy focus on intellectual skills at the lower end of the cognitive hierarchy. It is doubtful whether these skills can be relied on to facilitate the level of independence inherent in the tasks listed in the closed items section of this subtest, and which the students saw themselves as being capable of undertaking.

Thirdly the heavy use of stereotypical terms to identify qualities of self-discipline also deserves some attention. While acknowledging the value of these

qualities in any formal learning environment, it is my view that, in the context of conventional formal education, these qualities are more a reflection of doggedness and passivity than of creativity and boldness. Indeed the reason for their popularity as a response to a question on personal strengths may lie in the perception that they are highly valued within the prevailing institution-controlled culture of formal education. Thus the question that arises is: To what extent are student-teachers really committed to the moral qualities that they espouse and to what extent are these qualities (e.g. determination, persistence) sufficient in themselves to complement learner independence?

Fourth, the high proportion of responses entered as personal strengths and limitations that should more appropriately have been entered as external support factors is also worth noting. Given the frequency of this type of inappropriate response, it is evident that some students were either unwilling or incapable of identifying and examining attributes internal to themselves. What is of some concern is the apparent automatic manner in which these students located personal responsibility in elements outside of the person. Of even greater concern is the fact that this displacement of the self by the 'other' occurred much more frequently when listing limitations than when listing strengths. It is as if there was a tendency to apportion blame to factors outside of the self.

The picture that is emerging from the above is one in which adult learners who seem to favour a top-down relationship with their lecturers, whose sense of the academic demands of higher education does not seem to extend much beyond the lower level intellectual skills, who, to some extent, appear to be unable or unwilling to examine their own personal strengths and limitations, also clearly assert that they are capable of engaging in tasks that require considerable learner independence.

What the overall picture seems to suggest is that students may be responding at two levels in terms of their assessment of themselves as learners. At one level, they are probably defining themselves according to the values and expectations of the formal learning environment as they are currently experiencing it. At another level, they

probably see the notion of 'capability' as touching at the core of their self-concept as practising professionals which they do not consider to be bound by their current status as learners.

Conclusions

The following tentative observations have been drawn from this exploratory survey:

1. Student-teachers appear to be ambivalent about the extent to which they are reactive or proactive in their relationships with their lecturers. This ambivalence probably arises from the fact that, as practising professionals, they are used to being in positions of authority and in their current position as learners, they see themselves ceding that authority to other professionals.
2. Based on their choice of appropriate social settings, student-teachers appear to favour a variety of settings for different types of learning tasks. In particular, they seem to value small peer group collaboration (2-3 students).
3. There appears to be a tension in student-teachers' perception of their roles as learners. At one level they project themselves as being capable of independent learning while at another, they reflect the values and expectations that are consistent with the hierarchical structure of conventional higher education.

Whatever the limitations of the survey, what the above findings indicate is that the concept of social interaction, as discussed in Chapter 2, can provide a useful framework for examining learners' perceptions of their role and status in the formal teaching-learning environment.

CHAPTER 9

THE INTERPRETIVE FRAMEWORK: BUILDING THE CATEGORIES

Introduction

This chapter describes in detail the interpretive framework that was developed to set the boundaries of and illuminate the extended analysis of the data derived from the observation study. It also lists issues that emerged during the exercise of setting the framework. At the end of the chapter, the issues are summarised and two subsidiary research questions are generated to guide the subsequent extended analysis.

Overview of observation study

The observation study was designed to address the question:

What does the discourse of learners and their teachers reveal about learner-knowledge interaction?

Specifically, it would seek to,

1. To describe the knowledge-building activities that learners engage in.
2. To examine how teachers influence the knowledge-building activities of learners.
3. To examine the effect of the power relations between teachers and learners on learners' knowledge-building activities.

The main participants of the study were eleven student-teachers in two groups of seven and four respectively, pursuing the Certificate of Education in two different specialisations through UWIDITE, the audio-conferencing system of the University of the West Indies. These eleven students were located at two sites in Trinidad, the main one at the St. Augustine campus and the other approximately 50 kilometres from the campus, in the town of San Fernando.

During the period of observation, both groups were studying courses related to curriculum planning and implementation. For the purposes of this study, the group of seven was named Group A, and their course, Course A. The group of four was named Group B and their course, Course B. The supporting participants were the lecturers of the respective groups. Lecturer A was at a site in Jamaica while Lecturer B was at the St. Augustine site with the four student-participants of that group. An abbreviated version of the students names was used to preserve anonymity.

The interpretive framework

The framework comprised two sets of categories. The primary set were the five knowledge-building categories. These were,

1. Setting the objective of the interaction
2. Information transmission-reception.
3. Planning for the implementation of new methods.
4. Problem-solving
5. Higher order examination of course content.

The associated set were the control management function categories. These were,

1. Establishing control
2. Maintaining control
3. Gaining control
4. Operating under control
5. Breakdown of control

Aspects of both sets of categories were recognised as occurring simultaneously in any segment of data identified as a unit of analysis. However, in the interest of

clarity, the two sets of categories are discussed separately.

Knowledge-building categories

In classifying the data within the five categories of this set, it emerged that there were subsidiary attributes consistent with each category. These subsidiary attributes were constituted as sub-categories of the respective primary categories and these sub-categories were named knowledge-building acts.

Setting the objective of the interaction

This category name was used to describe an activity aimed at identifying the point of focus of the interaction. This involved two subsidiary acts, namely

1. describing the topic or task
2. interpreting the topic or task.

Lecturer A began **describing the topic** of a session in this way:

This is really a suggestion as to how you can organise your unit.

Then after a few other remarks, she continued,

Let's spend a few minutes looking down the subheads. Rationale, Scope of the Unit, Objectives, Activities, Materials, Linguistic Skills, Evaluation, Lesson Plan...

Similarly Lecturer B, in a session with the other group said,

So I want to talk about other ways of evaluating and assessing the holistic, collaborative, integrated classroom. That's why I'm talking about Evaluation and Assessment.

The label **interpreting the topic or task** was used to refer to acts that extended on the initial information. This extension was aimed at enhancing comprehension by illuminating the boundaries of the area of study.

Lecturer B sought to get students to think about the topic of non-traditional modes of evaluation and assessment in relation to the traditional demands of the conventional school system. She extended on the initial information in this way:

Now these are not typical classrooms in our schools. We are talking about an ideal type of classroom that we want to work toward... One of the difficulties is ... how do we assess and evaluate what happens in classrooms like these in the way demanded by our schools and systems?

Students were also involved in interpreting the topic. Student DN was seen paying close attention as Lecturer A outlined the topic on organising a teaching unit. She also made notes at regular intervals. However she also appeared uneasy. Eventually, she turned to the student sitting next to her and was overheard making the following comment:

I will do what I was doing all the time. I will find out what they (the pupils) were doing before, because I did not have the class before.

She continued this off-line exchange with her fellow student. My recording equipment could not capture her continuing remarks. However her hand movements appeared to be dismissive and I inferred that the content of what she was saying continued in the same vein as the comment outlined above.

The remark and accompanying gestures were given in response to Lecturer A's description and interpretation of the topic Unit Planning which was being discussed in preparation for the upcoming Practicum. DN's comment embodies her own interpretation of the topic which she was tailoring to suit her own purposes.

Emergent Issues

1. While it was normally the lecturer who set the topic or task, both lecturer and students engaged in the act of interpreting it.
2. In one instance a student appeared to have an interpretation of the topic that was different from that presented by the teacher.
3. The student shared her private interpretation with her fellow student at the site.

Information transmission-reception

Knowledge building acts included in this category were defined as those in which information was conveyed from one participant to be decoded and stored by another participant, at least during the session. It is important to note that this definition does not imply the notion of a passive listener. On the contrary, it recognises that listening, and by extension, reception are both active cognitive processes. Nonetheless, what is highlighted in this category is the fact that the knowledge building acts associated with transmission do not contain any readily identifiable elements aimed at engaging recipients in any behaviour other than those required for storing information.

The subsidiary acts identified in this category were,

1. stating facts
2. stating generalisations
3. Expressing opinions
4. Making recommendations.
5. Recording messages
6. Seeking clarification.

Participants were regarded as **stating facts** when they were making statements about events or situations that were held as having actually existed or occurred. Three units of analysis classified in this sub-category were,

Both articles offer strategies.

In the article dealing with Maths., there is something about subtraction.

In the sequence of the story being dramatised, you find him (the flying fish) jumping a little bit. And then each time he jumps, he jumps a little bit higher. Until finally, he jumps the highest. And then the story ends.

The second type of knowledge building act identified here was labelled **stating generalisations**. Generalisations were regarded as statements or propositions that

appeared to have been arrived at by generalising from specific incidents, events, situations. They were presented in a manner which suggested that they were universally applicable and that their validity was beyond question. Many of the generalisations identified were embodied in simple sentences constructed with the present tense of the verb 'to be'. Examples included,

Assessment is only a part of the evaluation process.

The goal of genuine evaluation is to make the learner self-monitoring.

Checklists are particularly useful when they are combined with other kinds of data.

It is worth noting that two of the above statements contain expressions that can be regarded as being value-laden (i.e. 'genuine' and 'particularly useful'). It can be argued therefore that this factor may undermine their status as generalisations and render them more as opinions. While this factor warrants consideration, it is the construction of the respective statements that dictates that they will function as generalisations. Hence, notwithstanding the judgmental nature of these two expressions, they are embodied in statements that have been constructed in a manner that makes them appear as if they were universally applicable.

There was one statement which, at a surface level could have been regarded as an opinion but which I included as a generalisation. Lecturer A made the remark,

You do know that it is much more difficult to understand what is required to answer the 'why' question, than it is to understand the 'what' and the 'who' question.

The use of the value-laden expression 'much more difficult', coupled with the personalisation of the statement may suggest that this is an opinion. However when the introductory phrase 'You do know' is taken into consideration, one may infer that the lecturer is recalling some prior teacher-learner interaction in which there was some examination of information and/or practices out of which emerged the proposition that

students have more difficulty understanding 'why' questions than they have understanding 'what' and 'who' questions. Thus a generalisation had been formulated based on findings derived from a prior teaching-learning event.

Expressing opinions was the label given to another sub category. Opinions were recognised when it was felt that the speaker was expressing an idea, personal belief or value judgment without using any accompanying statement to establish the certainty of the idea or belief or to support, explain or illuminate the judgement. A further characteristic of an opinion was that it embodied some element that suggested that the speaker was accepting personal responsibility for the statement made, as reflected in the inclusion of the phrase 'I think' or some synonym of this phrase.

The following two remarks by one of the lecturers were identified as opinions:

I find, regardless of how quote unquote slow the children are, if you have interesting resources and interesting activities, all of them can do it.

Well, I think that's a decision you'd probably have to make as a teacher.

Students were also expressing opinions. Following are two examples:

I think this is one of the most exciting things about the story, how the flying fish got its wings.

I think that the poem has great potential for speech training.

At times though, the speaker did not use a phrase to establish personal ownership of the opinion. However, the conditions under which such statements were made suggested that an opinion was intended and that the appropriate phrase was understood. For example, in reacting spontaneously to a statement made by the teacher on-line, one student was overheard telling her colleague, off-line,

That's kind of hard, yuh know.

This statement was interpreted as an opinion, with the phrase 'I think' being understood.

Another sub category of knowledge-building acts in the information transmission-reception category was labelled **making recommendations**. Inherent within these acts was an intention to influence hearers to adopt a particular way of thinking. Characteristic of this sub-category was the prescriptive nature of the language used as observed in words and phrases such as 'It is important', 'should', 'need', 'must'. These expressions suggested an implicit notion of correctness. Typical acts identified were,

It is important that we look at the theory behind what the writers are suggesting.

Your strategy, your discussion etc. must be informed by some kind of conceptual and/or theoretical framework

We have to gradually induct them into both the spoken and the written forms of the Standard Language.

There should be some way for the child to know where he has to improve his skills.

It is interesting to note that all these statements formed part of closing remarks, and would very likely have been intended to have a culminating persuading effect on the students. As in the case of the sub category, expressing opinions, recommendations were observed in contexts whose initial function was not information presentation.

Participants were also observed **seeking clarification** in an attempt to increase their understanding of some situation, event or object. Basically, what was required was an explanation. For example a Group B student asked,

Concerning something that went before, I would like to know the components of a unit of work.

There were several behaviours associated with the act of **recording information**. Students were observed listening, note taking or browsing through the reading materials, apparently guided by what they were hearing on-line. At other times they would display behaviour, both verbal and non-verbal to acknowledge that they

were receiving the message being transmitted. Evidence of this type of behaviour could be an 'aha', a nod of the head, a smile or a 'thank you'. All these behaviours were taken as indicators that information was being decoded and stored.

Emergent Issues.

1. Most of the transmission of information was done by teachers; however, from time to time, students were also observed performing this function.
2. Information was transmitted through a variety of discourse modes.
3. Information transmission was not confined to formal lecture presentations.

Planning for the implementation of new methods.

A defining feature of the acts included in this category was that the talk was overtly oriented to real-world practice. Participants were using their talk to describe action that they would ultimately put into effect in a real-world context. This feature distinguished this group of acts from those earlier categorised as information transmission-reception where the focus was on facilitating comprehension and probably private reflection.

Another core feature was that, for both lecturers and students, the planning exercise revolved around the use of strategies, that is, steps to be taken to put a particular method into practice. Three sub-categories were identified, namely

1. formulating a 'planning' task
2. describing strategies
3. querying strategies.

The first of the three, **formulating a 'planning' task**, was designed to engage students in talk for describing strategies to implement a specific method.

Lecturer A gave the following instruction:

I would like you to think of your own situation and tell me whether or not checklists would be appropriate for you and if so, how could you use it. The

specific things you would use it for.

The label **describing strategies**, was used to refer to situations where the talk was being used to outline, show or model what was to be done (or sometimes, not done). Examples of this type of act included the following by Lecturer A in the discourse on Unit Planning. She said,

One thing that is of particular importance to the Scope of the Unit, I had mentioned that you need to give some insight as to (unclear) where, what level the children are operating, what's their ability... Please do not make statements like, this child is ten and should be in Grade X.

Similarly, in her response to a task on the use of checklists (see sub category below), VN offered the following strategy:

You can make a list of progressively (unclear) topics that each child should have a chance of doing and as the child progresses from one to the other, that can be well, ticked off or something.

There were also instances where lecturers were describing strategies in response to queries raised by students (see sub category below). In her reply to a query on the integration of subjects, Lecturer A advised,

I'd rather you try to integrate the few that you are comfortable with rather than rushing to mass integration and (unclear) you cant handle it.

A similar type of act was observed when, in addressing the issue of checklists and writing raised by a student, Lecturer B stated,

Well, the child should write freely, yes, but there is going to be some intervention at some stage in that process either by other students or by the teacher in a way that we've talked about, how the sharing process happens. You don't want to point out everything. You don't want to overwhelm him with incorrectness...But ahmm, gradually, there should be some way for the child to know where he has to improve his skills.

In the last two units of analysis listed above, the lecturers' descriptions were in response to queries raised by students. What is worth noting in both instances is that, in addition to improving students' understanding of the methods being discussed, the lecturers also appeared to want to define common ground and not completely exclude the students' conceptions. This is evident in their cautious use of language as reflected in phrases like 'I'd rather' and 'Well...yes, but...'.

Alongside the above, there were other knowledge-building acts labelled **querying strategies**. This label was applied to those acts where participants were observed raising questions in a manner which showed that they were expressing doubt or even challenging statements made by another participant. In one instance, SN of Group B made this observation:

Well, all this is very new to us, eh! Ahmm, So I was just wondering, is it then that ahh, we could allow the child to write freely and then after writing, he would now use his checklist to go through and see if the spelling is OK or the grammar or what have you?

DN of Group A raised the following question about an integrated unit:

Do you have to integrate all the subjects or you can integrate a few of the subjects and do single subjects for the rest?

At a later point within the same episode, DN was challenging the lecturer's response to her previous query. She contended,

So in that case, the Scope of the Unit will not be an integrated unit. If you have let's say, three subjects integrated, and single subjects for the rest, then you can't say that the Scope of the Unit is an integrated unit. You have to put both!

Emergent Issues

1. Students appeared to be having difficulty accepting the strategies being proposed by the lecturer.
2. In querying the strategies proposed by the lecturers, students were shifting the direction of the discourse.

3. Lecturers were making attempts to incorporate students' conceptions as revealed through the queries of the latter.

Problem-solving

In the context of this study, the term 'problem' is used to refer to any operation that has to be undertaken in a teaching-learning situation and for which strategies must be devised in order to facilitate its execution. Problems were generated from two sources in the data. In the first, students brought to the sessions situations that they were having difficulty in handling in their own classroom practice and so were seeking the assistance of the lecturer in arriving at solutions. In the second, problems based on typical classroom operations were simulated and students were required to identify appropriate strategies for addressing them. Problem-solving involved all participants in tasks aimed at generating strategies for addressing either actual or simulated operations.

The approach to problem-solving emerging from the data was largely instrumental (see Schon, Chapter Five). Whether the task was undertaken by a student or a lecturer, it was the instrumental, means-ends approach that was dominant: there was a problem and participants would suggest ways of solving it.

As was the case with the activity, 'planning for the implementation of new method', the problem-solving exercise involved some action to be implemented in a classroom context. However, a distinction is being made between the two categories. In the former, the starting point was a specific method, the intention being to show how the method could be put to use in an appropriate classroom operation. With problem-solving, it is the operation itself that was the focus of interest and the task was to devise a route that provided optimum opportunity for attaining the goal of the operation. Three sub-categories were identified namely,

1. formulating the problem-solving task
2. outlining a solution
3. examining the problem situation.

In **formulating the problem-solving task**, the speaker outlined the problem to be addressed and asked that a solution be found for it. This knowledge-building act would typically contain two components, one being a description of the problem itself and the other, a question requesting a solution to the problem described.

FS outlined one such task in this way:

How do you address levels? Like in a class with say eight (8) children at five different levels or five different topics in a particular subject. How do you address that?

CL's task description was the reverse of FS'. She started by outlining her expectations of the lecturer before giving the description of the problem. She said,

I will tell you and then you will tell me and make some suggestions and so on. If I ask a question like ahm, 'Where is that? What is that? Or even a question like, A girl has just hit a boy, 'Why did you hit him?' I will not be getting an answer for, for that question. OK, 'why' and I'm looking at 'what' and 'where', even 'who'. So I find sometimes what I may need to do, do once @ week, is focus on objects in the classroom like 'What is this', before I go on to another concept.

The format for the simulated task that Lecturer B described was more complex than the student-generated versions listed above. The two components were present but in a more integrated fashion. In addition, instead of making a request for a solution to the problem as a whole, this task statement was soliciting strategies in relation to specific aspects of the problem. Thus Lecturer B asked:

What would you do with this story in the classroom to facilitate students' understanding and how would you effect responses from students to this story?

Students were required to generate strategies first to facilitate their pupils' comprehension and secondly to effect higher-order responses from them.

Outlining a solution was another aspect of this knowledge-building activity. Two types of units qualified to be members of this sub category. In one type, the

solution involved description of the speaker's own practice, as evidenced by the subjective first-person perspective of their respective accounts.

VN, in responding to the task regarding different ability levels, said,
The class that I have is not bad. It's just a matter of some moving faster than others. So what I do is, I let those who can cope work on their own and the ones that have problems, I work with them.

Lecturer A herself had this to say about her approach to different ability levels:
The activities I am asking the children to do vary. When I am teaching a class, regardless of the level (incomplete). As I was telling you about the project I'm in, I have a variety of levels... Most of them are very slow... But I find that I expose all of the children to the resources, to the activities. ... When it comes to the task, the culminating activity, this is where I scale the activity, this is where I discriminate.

With regard to the simulated teaching-of -the-story task, SN stated,
If I am able to retell that (story) or to say it just the way you did it, with all the dynamics in it... I would ask the children to sit quietly, lean back... And when they are finished, when I am finished, I will ask for volunteers as to how they will interpret (the story).

A more prescriptive approach was observed in the second set of acts in this sub-category. Participants used language that essentially set the speaker apart from, and by extension in a position of greater authority to the hearer. Lecturer A summarised the discussion on different ability levels in this way:

I suppose we need to do more integration. Because if you are integrating your subject areas then you find that since (incomplete) ... You are doing an integrated thing. Then in that so-called one period, that child would not be exposed to content in one specific area but in a variety of areas.

In another situation it was a student doing the prescribing. A student from another site had raised a problem that one of her pupils was having in the area of mathematics. DN advised,

What she has to do is give examples and non-examples. A lot of examples and a lot of non-examples with it. Hopefully if she does it more than once, more than twice, more than three times, she (the pupil) will get it...

Another important aspect of the problem-solving exercise was the strategy adopted to facilitate movement from the problem statement towards an appropriate solution. The acts involved in this process have been described as **examining the problem situation**. The term 'problem situation' is used here to refer to any facet of the problem-solving exercise. Hence what was being examined could be some aspect of the initial problem itself, some factor that emerged within the process or probably a solution that was being proposed.

These acts included questions/instructions used to facilitate examination of the object of study. These questions/instructions were generated within the interaction as a result of the speaker's (usually the lecturer's) assessment of the exchange up to that point. They are therefore considered to be different from questions or statements formulated to set the original task.

The following are some lecturer-generated questions included in this sub-category. In guiding the student towards a solution to the problem on the teaching of 'Wh' questions (see above) Lecturer A asked,

OK, why is it they are not able to understand it? Which of the 'Wh' questions do they understand?

Then after a response, she asked again,

Why have you started with those two?

A similar strategy was employed to facilitate examination of solutions suggested for the simulated story-teaching problem. Lecturer B interrupted a student's response with this intervention:

You said drama, re-telling, dialogue, art, make up a story. Choose one of those and give us a few more details of what you would ask the children to do.

At a later point, she asked further,

And ahh, what would the teacher's role be in that situation?

Responses to the questions/instructions listed above, were also included in this sub category of examining the problem situation, once these responses reflected some attempt at conducting an examination. The following statement by CL on the teaching of 'Wh' questions was included.

They know that 'what' refers to things and 'who' refers to (incomplete) OK.

That is just a basic sort of description for both words. But to me, to come from those questions to another is like, I may have to take my time and do that, because I may confuse them.

Not included in this sub-category was the following statement which formed part of an episode whose dominant function was problem-solving. The statement was,

I think that the poem has great potential for speech training.

It was not included because it was not regarded as embodying the function of examining. Rather it was seen as making a judgement, with no attempt to substantiate the judgement espoused. As noted earlier, it was categorised as expressing an opinion.

Emergent Issues

1. Lecturers as well as students were involved in initiating a problem-solving exercise.
2. In moving towards the solution, teachers sought to engage students in an analysis of some aspect of the problem-solving exercise.
3. Students often relied on personal opinions to express their assessment of a problem or to justify the appropriateness of a solution proposed.

Higher order examination of course content

This category name was used to subsume knowledge-building acts which were seen as serving two combined purposes. First they showed participants engaging in activities aimed at exploring the subject matter content beyond the level of recognition and recall. In this regard, there were acts related to analysis, evaluation and synthesis of the content. Secondly, there appeared to be an intention that in this aspect of the overall teaching-learning interaction, students should engage with knowledge at a more abstract level rather than at a level more directly associated with their everyday practice. The two sub-categories identified were,

1. formulating the higher order thinking task
2. performing the higher order thinking task.

One example of the first was an analysis task posed by Lecturer A as she introduced a study of reading materials. She explained,

Apart from the subject area, how does this article differ from the one by Hartmann and Kretschmer? How does it differ?

Then she rephrased it in this way:

Is there a specific study reported in this article or are the authors drawing from a series of studies, a theoretical paper?

At a later point she rephrased again:

Is it (one of the articles) theoretical?

In another episode, Lecturer A set the group a synthesis task asking the students of each site to formulate a question on the reading material and to put that question to students of another site. She elaborated in this way:

It's a matter of while you are reading, you are thinking... So what I'm asking you to do is think up a question, (a question) that came to mind while you were reading and then ask another site.

Performing the higher order thinking task was the label ascribed to acts that showed participants undertaking the task presented at a level recognised as being consistent with that set by the task itself. (This does not imply that the responses were necessarily appropriate to the task set). Two responses that were considered as meeting this criterion were,

They (the articles) are the same in that they are both concerned with linking previous knowledge with what is to be taught.

It (one article) is theoretical, although the writer, what I'm saying is, it's not that this study was done for this paper. The writer was giving his experience and based on that he was able to develop this paper.

Emergent Issues.

1. The lecturer made repeated adjustments to an initial task statement in an attempt to make it more accessible to students.
2. Students seemed to be experiencing difficulty in engaging with knowledge beyond the level of practical applications.

Summary of knowledge-building categories

Table 9.1 provides an overview of the knowledge-building categories.

Table. 9.1: Overview of knowledge building categories

CATEGORY NAME	SUB-CATEGORIES
Setting the objective of the interaction.	describing the topic/task interpreting the topic/task..
Information transmission-reception	stating facts stating generalisations expressing opinions. making recommendations seeking clarification. recording information
Planning for the implementation of new methods.	formulating the 'planning' task querying strategies. describing strategies.
Problem-solving	formulating the problem-solving task outlining a solution. examining the problem situation.
Higher order examination of course content	formulating the higher order thinking task performing the higher order thinking task

Control management categories

Also embedded within the units of analysis were strategies through which participants were positioning themselves in relation to each other to assert, accept or reject the authority of the knowledge claims being made in the interaction. Five control management functions were identified namely establishing, maintaining and gaining control, operating under control and a fifth, breakdown of control.

Establishing control

Participants were regarded as establishing control when they were observed initiating the interaction, setting the topic for the interaction or setting a task to be

undertaken by other participants. Lecturer B performed such a function when she said,

I want to talk about other ways of evaluating and assessing the holistic, collaborative, integrated classroom.

Student FS did the same when he outlined a problem-solving task in this way:

How do you address levels? Like in a class with say eight (8) children at five different levels or five different topics in a particular subject. How do you address that?

Student VN was also establishing control when, as a result of the open-ended task set by the lecturer, she herself set this task for the rest of the group:

From the article, 'From the concrete to the abstract' - the first sentence: 'Mathematics is a neglected area in the total instructional component in a deaf child's education.' What are your views on this? Do you agree with the statement or not?

Maintaining Control

Participants were regarded as maintaining control if it could be detected that they were using strategies that allowed them to retain a dominant position in the interaction once they had previously assumed it. Several strategies were used to achieve this.

In cases where there was an exchange, a participant would maintain control through being able to determine how and when other participants engaged in the exchange. In this formal teaching-learning situation, this function was usually performed by the lecturer and was accomplished through the use of questions such as those identified in the knowledge-building sub category, *examining the problem situation*. These questions, which were generated as the interaction progressed, served to adapt the exchange and to elicit specific information from the student.

This approach was evident in the way Lecturer B guided SN's description of a strategy in the simulated problem-solving exercise.

You said drama, re-telling ... Choose one of those and give us a few more

details of what you would ask the children to do.

Then further she asked,

And what would the teacher's role be in that situation?

Another strategy that served the function of maintaining control was the provision of feedback. In such cases, one participant regarded himself or herself as having the authority not only to assess the contribution of another participant but also to inform the other of that assessment. At times, feedback took the form of a single phrase like 'Good idea', 'OK', or 'You are correct'. At other times, it was more detailed and informative. For example, Lecturer B made the following remark as a follow-up to solutions outlined for the story-teaching task:

One thing that occurs to me is that you need to be very precise with the task.

You cant just say to a group, well, 'You're going to dramatise'.

Of even greater significance though were the control maintenance functions embedded within the linguistic structure of the discourse. This was particularly evident in the knowledge-building acts identified in the information-transmission reception category. Two sub-categories stand out.

A noticeable feature of the generalisations is the complete absence of any hint of ambiguity in what is being said. The simple uncluttered sentence structure enhances the power of the communication and the use of the simple present tense emphasises the sense of timelessness and universality. Thus, it is likely that statements such as,

The goal of genuine evaluation is to make the learner self-monitoring.

are communicated in a way that suggests that they are irrefutable and beyond question.

The prescriptive language of the recommendations also project the speaker as someone with the authority to persuade and influence thought as evidenced in a statement such as,

Your strategy, your discussion must be informed by some kind of conceptual

and/or theoretical framework.

In addition to allowing the speaker to maintain control of the interaction, it is likely that the above use of language could convey the impression that the knowledge claims themselves are to be accepted as given and beyond examination.

Gaining control

The third category was described as gaining control. This category name was applied where there were features in the talk that showed a participant moving from a subordinate to a dominant position in the interaction. Movement was considered to have taken place when talk was used to bring about a shift in direction.. A shift could be effected in two ways: by the addition of a new dimension to an existing topic, or by changing the topic completely. The knowledge building acts grouped as 'querying strategies' in the *planning for the implementation of new methods* category were regarded as a shift of the first type mentioned, as for example when DN asked,

Do you have to integrate all the subjects or you can integrate a few of the subjects and do single subjects for the rest?

or when FS asserted,

You said if the objective is not realised, do not re-teach the lesson. ... I'm assuming that you mean do not teach over the lesson before finding out exactly what's wrong.

In the first of the two units of analysis, DN is introducing the possibility of planning a teaching unit that only partially conforms to the requirements of an integrated unit. In the second, FS appears to be extending the context in which the objective is being examined, by linking it to the teacher's moral obligation to the pupils.

A shift of the second type could be seen in FS's proposal to the lecturer concerning the use of portfolios. He remarked,

Based on what you are saying, it seems as though a portfolio is merely for evaluation and record keeping... What about using it for follow-up work?...

The term 'merely' in the first part of the statement suggests that FS had probably introduced the lecturer's comment only to dispense with it. This view is strengthened by the use of the phrase 'What about' to introduce the second part. It signals an intention to point the discourse in a new direction. FS's style of talk suggests that he must have considered himself above dealing with the information as presented by the teacher and was himself proposing a clear alternative.

Of importance in this category too is the role that language plays in facilitating the shift in control position. DN's movement from the question structure ('Do you have to integrate') to an affirmation ('you can integrate') while maintaining the questioning intonation seems geared to asserting what she intends to do while at the same time conveying the impression that she is seeking clarification. In addition, FS' use of terms like 'I'm assuming' and 'merely' seem to carry an intention to minimise the strength of the knowledge claims of the other participant in order to focus attention on his own.

Operating under control

The fourth category was labelled operating under control. It was considered necessary to include such a category based on the assumption that participants in their role as recipients, also contribute to the management of control within the discourse. Participants were regarded as operating under control when they were observed responding to stimuli from another participant. This category type was applied to both verbal and non-verbal, public and private responses. Direct responses to questions posed or instructions given, as well as short phrases acknowledging agreement or expressing satisfaction with what was said were included. Also regarded as a response to a stimulus presented were questions seeking clarification, since these were not seen as occasioning a shift in the direction of the discourse. For example, after listening to the guidelines presented on assessing ability levels, DN asked the question,

Could you give me a clearer indication of what you mean by, talking about the indication of the level? Do you have to say their level for every subject, what they can do in every subject area?...

Also included in this category were the acts of listening and note taking, browsing, making off-line private comments and gesturing.

Of particular interest were the instances where students could be seen resisting a message presented, as for example when CL made the spontaneous remark, 'that's kind of hard, you know!' to DN, after hearing the lecturer's views concerning 'effective teaching'. Another example of this resistance was observed when all four students of Group B could be seen gesturing to one another, disagreeing with the lecturer's explanation of a grammatical feature. The lecturer had said that 'the same word' was being used in the two sentences she presented as examples, namely 'Vishnu was active' and 'Vishnu was actively strange'. At one point LD could be seen mouthing the comment to her colleagues, "It's not the same word!" Eventually the lecturer recognised her error and corrected herself by inserting the term 'root' before 'word', without any overt intervention by any of the students. This private resistance was also considered as operating under control since the students, for whatever reason, were unable or unwilling to voice their objections in the public discourse.

Breakdown of control

The final control category was described as breakdown of control. At one level this category name was applied to situations where students were seen withdrawing attention from the official discourse as reflected in the blank, unconnected look on their faces or in their opting to engage in non-task related actions. In one such instance, CL turned her attention to a newspaper during the lecturer's extended explanation of issues related to the 'Wh'-question problem which she CL had originally raised.

The label was also applied to those instances when a question had been posed and no response was forthcoming.

In summary the five control management functions were establishing, maintaining and gaining control; operating under control and breakdown of control.

Emergent Issues

1. To a large extent, control positions in the discourse emanated from the roles that the speakers occupied in the institutional setting.
2. Significant control management functions were embedded in the linguistic structure of the discourse itself.
3. The teaching-learning interaction seemed to be built on assertion, persuasion and sometimes accommodation on the one hand, and a combination of acceptance, challenge, defensiveness and non-engagement on the other.

Summary discussion of emergent issues

This section summarises the issues that were generated from the category-building exercise, then pulls them together into two subsidiary research questions, which would be used to guide a more detailed analysis of the data.

While there was evidence of five types of knowledge-building activities, the dominant one in terms of the range of acts was the information transmission-reception category. Moreover the acts ascribed to this category occurred not only in episodes that were clearly intended for information presentation, but also within episodes whose stated function fell within one or other of the other four categories.

Closer examination of the acts themselves showed that they embodied clear linguistic features capable of asserting the authority of the knowledge claims that they were transmitting.

Students were not without their own strategies for dictating what they should learn. Their queries, evaluation statements, expressions of private objections all represented attempts on their part to shape the knowledge they were building. It is important to note though that such challenges occurred mainly when they were participating in interactions that dealt specifically with their classroom practice.

Also of interest were the attempts that lecturers made to get students to engage with knowledge at the level of the abstract. This type of cognitive activity represented a small proportion of the sessions observed. This was probably so because, at this stage of the programme, the emphasis was on preparation for supervised classroom practice.

Nonetheless it was evident that the higher order examination of course content was a difficult undertaking for participants.

The tasks set for this purpose were based on specific readings and no doubt, the fact that students either did not read the relevant article(s) or only did so superficially, contributed to the difficulties experienced. However it is likely that this may not have been the only contributing factor.

As far as the two practical-oriented categories were concerned, there was not much variation in the strategies employed within the interaction for implementing either of them. Of special interest though was the attempt by the lecturers to encourage greater use of analysis in the problem-solving exercise.

In light of the foregoing, the following subsidiary research questions were formulated to guide further analysis of the data:

1. What are the factors in the teaching-learning interaction that facilitate and/or hinder learners' construction of a professional knowledge base?
2. What are the factors in the teaching-learning interaction that facilitate and/or hinder learners' development of efficient and appropriate strategies for classroom practice?

I recognise that these two questions are not necessarily mutually exclusive. However I have decided to make this separation for the purpose of analysis in keeping with an intention which I perceive both in the professional literature as well as in my own data that the goal of teacher education should be the development of a teacher who is both an informed professional and a competent practitioner (e.g. Alarcao and Moreira, 1993).

CHAPTER 10

BUILDING THE KNOWLEDGE BASE.

Subsidiary research question:

What are the factors in the interaction that facilitate and/or hinder learners' construction of a professional knowledge base?

Introduction

In order to address the question stated above, this chapter focuses on two of the five knowledge building activities, namely *information transmission-reception* and *higher order examination of course content*. In both categories, the chapter analyses the discourse of lecturers and students both separately and jointly.

As expected in this formal educational setting, lecturers transmitted a higher proportion of information than did students since they were the ones with the responsibility for delivering the lectures. They were observed engaging in this knowledge building activity when they were introducing new information or when summarising an exchange. The chapter therefore analyses lecturer's presentations to investigate both the content and the form of what was transmitted.

Since students hardly ever interrupted these presentations, only limited direct verbal data were collected about their responses during the sessions. The chapter therefore examines relevant segments of the interview since this instrument was used in part to collect data about students' understanding and/or interpretation of the lecture presentations.

The knowledge building category entitled *higher order examination of course content* also informed data analysis in the context of the question stated above. This activity would typically involve a question-answer exchange between teacher and student on some aspect of the subject matter content. In this chapter it is used as the basis for an investigation into the extent to which students were engaging in intellectual

activity at the higher levels of the cognitive domain and were able to engage with knowledge at an abstract level.

The chapter deals with these two knowledge-building activities in four sections, three pertaining to information transmission-reception and one to higher order examination of course content. The first section deals specifically with the lecture presentation both in terms of how information is transmitted and how it is received. The second examines the verbalised internal processes of a student as she seeks to determine whether she has accepted teacher-transmitted knowledge claims. The third pays attention to the way an argument is constructed and transmitted by the lecturer and, by extension, how it is handled by the student. The fourth is based on the second category, namely *higher order examination of course content* and examines students' capability in the area of critical analysis.

The lecture presentation

Lecturer B used a section of one session to deliver a lecture on evaluation and assessment. The episode reproduced below is an extract of that lecture presentation.

Lec If data collection is being used only for accountability, for grading and reporting to parents and that's what it is most often used for, meaningful evaluation is not taking place. What is taking place is simply accountability and data reporting.... The goal of genuine evaluation is to make the learner self-monitoring, self-regulating and independent. You know what we've said several times before. We want to set the children free so that they can do things on their own and not rely on us all the time. (*Lecturer draws students' attention to chart on 'The data gathering profile' which they must study for the next session.*). Evaluation involves observation of process and product and collecting data. Now we've talked about these things before, haven't we? We are observing what goes on in the classroom, how the learning goes on, the process, as well as what is actually produced. We are not evaluating the product alone. That's the whole basis of the writing process. And then we saw, out of the writing process, the reading process, we have to be aware how it goes on. And that is where the teaching takes place and when the teaching takes place. It's not just the final product that we carry home in a notebook and mark. So it involves recording observations and data. We have to put these things down some place, and not just a quantitative mark but more so narrative, prose statements about what the children are doing...

What is transmitted...

There is a heavy reliance on generalisations in this episode. The lecturer asserts, "The goal of genuine evaluation is to make the learner self-monitoring..." and "Evaluation involves observation of process and product and collecting data". There are recommendations, as implied in "We want to set the children free", and clearly stated in the prescription, "We have to be aware how it (the reading process) goes on". There are also statements that communicate as factual information, as situations and events that actually exist or take place, as for example in the statement, 'And then we saw, out of the writing process, the reading process, ... And that is where the teaching takes place.' There is an assertive characteristic in all three types of language use which serve to assert the authority of the knowledge claims embodied within the discourse.

The overall effect of these acts is further enhanced when viewed in the context of three broader features of the episode taken as a whole. First the information is highly contextualised. The topic of evaluation and assessment is treated not just as an aspect of formal education in a general sense, but as a component of the classroom practice of the student-teachers themselves. There is direct reference to the actual location of the students' everyday practice ('We are observing what goes on in the classroom'), as well as to the specific events peculiar to that practice, as reflected in the recommendation 'We have to put these things down some place.' The colloquial expression 'to put something down (in writing)' would be readily recognised by practising teachers as the activity they engage in whenever they enter grades or any other form of assessment in notebooks or on official record cards held by the school administration, or in report books through which parents are informed of their children's progress.

This new approach to evaluation and assessment is not presented as a distant abstract notion. Rather it is being constructed to make it appear as an integral aspect of the everyday experience of these student-teachers. The lecturer's approach to introducing this new evaluation strategy is, to some extent, reminiscent of Brown, Collins and Duguid's (1989) notion of situated cognition and of the importance of

locating learning experiences in authentic situations. It is important to note though that unlike what Brown et al. propose, the environment itself did not really play a part in generating the knowledge being presented by the lecturer.

Secondly, the frequent use of the subject pronoun 'we' is very likely intended to engender a sense of collective purpose and action. The overall impression conveyed is that the message applies to all participants, lecturer and students alike, in their common role as members of the professional community of teachers. Implicit in the message are incidental yet significant statements that appear to suggest that lecturer and students already share certain ideas and ideals regarding this professional role. At one point the lecturer says, 'You know what we've said several times before', and 'We've talked about these things before'. It is in that context that students are being persuaded to engage with the new ways of thinking about evaluation and assessment, in the interest of the common object of concern, the children.

Thirdly, the discourse is constructed in a manner to imply that the new and innovative is inherently superior to the old and the conventional. At the beginning of this episode, the lecturer seems to be alleging that accountability is a key feature of the old, traditional approach to evaluation and she expresses the opinion that this emphasis on accountability does not constitute meaningful evaluation. Then she follows this up immediately with the generalisation about the goal of evaluation. The contrast between the old and the new is further reinforced by the juxtaposition of terms: on the one hand, 'only' and 'simply' are linked to the traditional 'accountability', while the words 'meaningful' and 'genuine' are used in relation to the proposed approach to evaluation. This bias away from old practices towards the new continues throughout the episode. At a later point there is the comment that it (evaluation) is not just the final product that we carry home in a notebook and mark (the old), but rather that it involves recording observations and data.

In this lecture presentation, generalisations, factual information and recommendations are combined in a manner that conveys the impression that the knowledge claims being transmitted, are beyond question. The episode does not contain

any language that invites reflection or analysis. Rather the language is direct, assertive and authoritative.

Underpinning and supporting the above is a pattern of control that is consistent with the conventional relationships within a formal teaching-learning interaction. Notwithstanding perceived attempts to foster the notion of a community of professionals, the underlying reality is that within the interaction, it is the lecturer who occupies the dominant control position. She is further able to maintain that control through her greater familiarity with the official subject matter content and through her shaping of the language to influence the thinking of the students.

In fact it is this dominant control position that confers on her the authority to define the relationship among participants in the interaction. Thus the notion of a collective that is implied in her talk cannot be regarded as eliminating the power relationships. One may say that to the extent that there is a community the lecturer is a senior member and the students, junior members.

... and what is assimilated

Students did not communicate on-line during this presentation. Rather they were largely engaged in recording the information alternating between taking notes, listening and browsing through their reading materials. Given the absence of any overt student input, interviews were used to solicit their likely responses. Students of Group B were therefore asked to examine and react to information about evaluation and assessment that they had received, in light of their own prior knowledge of the topic. The instructions were specifically intended to direct them to make a link between new and old knowledge on the topic.⁹

⁹ The initials 'OK' refer to the researcher. An abbreviated version of the names of participants was used in the following episode and throughout the data analysis to preserve anonymity.

OK: Now, I believe that when you went into that session you would have been focusing on the things you already know about evaluation, assessment and so on. What I would like you to do now is to kind of focus on all that you know about evaluation and assessment, and tell me what are your thoughts, your views on the principles I will be mentioning. Okay. The current thinking is that pupils must develop their own self-assessment skills. Right? And some of the new approaches provide the opportunity for pupils to develop the ability and the know-how to evaluate and assess their own performance. I want to hear from you now, how you feel about that. Do you feel comfortable with that kind of perspective?

LE Yes, I agree that students should be able to develop (*incomplete*) Teachers tend to just get these techniques (on essay writing) down and not really allow the child to go through the process of writing. Those types of techniques that we as teachers are using, the traditional techniques are really keeping back the growth of our children and I will really prefer to see teachers using the process approach where children move from one stage to the other and they can view what they are doing and see their development...

OK What about that aspect of the new approach that says that they must develop skills to assess themselves, children assessing themselves.

LE Yes, I agree that with time and practice children can start deciding, well this piece of work, you know, isn't as good as the piece that I would have done. Okay, he might be able to look at pieces of work that he has done during a certain period of time and look back at his portfolio and see where he has come from to where he is now... So he himself can start assessing his work, you know, given certain guidelines from the teacher in the classroom.

OK I'm interested in that statement, that last statement about guidelines from the teacher. You have ideas about how, you know, how the teacher could put in place these guidelines, pass on these guidelines?

LE Well, I guess the teacher in the classroom can sit with the group and they can decide, you know, draw up rules as to what they are going to be doing. Like in the case of a teacher who is probably in a Standard One class and she has, I'm referring again to essay writing, she has probably done adjectives and nouns... and the children now have to write. They can now come together as a group and say 'Well, these are what we are going to be looking for in the writing...' So they have agreed on what is to be expected.

OK Before they actually start.

LE Yes, so they have the criteria, they know exactly what they are looking for. What they are zeroing in on.

It is very evident that LE completely endorses the lecturer's perspective on this area of teaching. What is interesting is that she demonstrates her support not only in what she says but also in how she says it. Further examination of her talk reveals that she has not only adopted the content of the lecturer's ideas but also the manner in which

those views were constructed.

Several features of the lecturer's talk are readily discernible in hers. Like the lecturer, she personalises and contextualises the knowledge, dealing with all aspects of the topic from the standpoint of her practice. As if by instinct, she operationalises the generalisations and principles of portfolio assessment within the framework of a concrete classroom operation. She locates these principles in the experience of a typical child as he makes decisions about which essays he should include in his portfolio over a period of time.

Like the lecturer, she expresses her opinions about what is good for the children. She says '... the traditional techniques are really keeping back the growth of our children'. She also makes subtle recommendations to her peers ('I will really prefer to see teachers using the process approach') and in so doing, demonstrates that she holds the same ideal as her lecturer.

On the whole both lecturer and student are treating their knowledge claims as if they are irrefutable. There is a certain element of dogma in both treatments, as if neither speaker is willing to entertain alternative perspectives.

This similarity in treatment strongly suggests that, notwithstanding an apparent sense of personal conviction displayed, LE is still probably operating under the control of the lecturer, even though she is physically removed from the direct person-to-person contact in the audio-conferencing environment. It is as if she is simply reproducing what she has received. LE's talk brings to mind the distinction which Bakhtin (1981) makes between assimilated discourse that is authoritative and assimilated discourse that becomes internally persuasive. LE is applying and even prescribing something that she does not seem to have made personally meaningful.

However in spite of her assertions regarding the value of the new approaches, there is a small segment in her account that suggests that she is still experiencing some tension between old and new conceptions of the professional knowledge of the teacher. With regard to the essay-writing example that she uses to demonstrate the use of portfolios, she explains,

Like in the case of a teacher who is probably in a Standard One class and she has, I'm referring again to essay writing, she has probably done adjectives and nouns ... and the children now have to write ...

This segment of the talk suggests an orientation to classroom practice that is informed by a teacher-centred conception of teaching and learning. It is the teacher who sets the agenda and determines how it is to be executed. The sequence of events is clear: after the teacher 'has done adjectives and nouns', the children 'now have to write'. One wonders to what extent this top-down relationship can eventually culminate in the more symmetrical mode of operation implied in the subsequent statement that the teacher and pupils 'can now come together as a group' and agree 'on what is to be expected'.

The discourse therefore reveals variation (Potter and Wetherell, 1987). A teacher-centred conception of teaching and learning is embodied in the same stream of thought as an apparently learner-centred conception, but there is no overt attempt to reconcile the two. Indeed it is very likely that the speaker is not aware of the contradiction in her talk. Thus one conception is simply imposed on the other: the strategies related to developing and using portfolios, a learner-centred approach to assessment, are imposed on conventional teacher-centred approaches to essay-writing, notwithstanding the inherent tensions between the two as revealed in the discourse itself.

It would appear therefore that the interpersonal interaction between the lecturer and the student does not allow for the type of learner-knowledge interaction that can facilitate knowledge building from which the student is able to construct meaning as advocated by the constructivists. This issue will be discussed further in Chapter 12.

In search of meaning

It is important to note though that not all students of this group accepted teacher-transmitted claims without reservation. In her interview, another student, SN displayed some uneasiness about the lecturer's perspective on the topic of evaluation and assessment. She was not present at the session to which I was referring but it was

evident from her response that the topic was addressed in previous sessions that she had attended. She had this to say in response to a question similar to that posed to LE:

SN Well, of course all these things that (the lecturer) is telling us, I mean, we are hearing it for the first time because we didn't read it anywhere before. But it fits very nicely with my psyche and how I think about things. It presupposes, however, that the child is able to express himself in the language, because if the child is not able to do that, then you really would not be able to get what you call a qualitative assessment. Right? But I like the idea, you know, to say, well, okay 'Last two weeks I didn't know this and now I know it', as opposed to 15 out of 25 as the case may be.

SN begins her response to my question in a manner similar to that noted in LE's account. Like her colleague she establishes her support for the new ideas. However while LE adopts an authoritative, prescriptive stance, making generalisations and offering recommendations in a manner similar to the approach taken by the lecturer, SN uses a more descriptive talking style, opting instead to focus attention on her handling of this new knowledge. Her use of the subject pronouns 'I' and 'we' and the possessive adjective 'my' suggest an intention to accept personal responsibility for the knowledge claims of which she is declaring herself in favour.

Unlike LE, SN reserves the right to question the ideas that she is supporting. The descriptive therefore merges in to the reflective as she seeks to examine the appropriateness of the new way of thinking in the context of her knowledge of current practice. She draws on previously held knowledge to make sense of the new knowledge to examine the new in relation to the old. Specifically she draws attention to the child's competence in language use as a factor to be considered when advocating more qualitative approaches to assessment.

Her restatement of her support can be taken as reinforcing her acceptance of the new modes of assessment. Indeed her introduction of specific data, comparing the qualitative with the quantitative, can be regarded as underscoring the perception that she is fully aware of what she is supporting. However it is also possible that she is anxious not to convey the impression that she is being disloyal and rejecting the accepted wisdom of the professional community. Thus her intuitive urge to question is set aside

as she hastens to restate her agreement with the ideal.

This perceived tension between SN's inclination towards learning as deriving personal meaning and her concern about not appearing to contradict the status quo emerges even more clearly in her assessment of the course. Towards the end of the interview she was asked to comment on the course as a whole.

OK Finally, are there any ideas, topics or themes which you feel are important in the study of this course that you felt, from your point of view, was not adequately dealt with?

SN In this particular literacy course?

OK In this particular course, yes.

SN (*pause*) Yes, I think, yes. It would have to do with the skills of reading. You see the modern trend towards reading is, as you say, collaborative, holistic type of thing and there seems to be a movement (*incomplete*) Now she (lecturer) didn't really say so (*incomplete*) there seems to be a movement away from the sub-skills methods of teaching reading, and that is good. But at the same time, this particular course did not teach us (*incomplete*) I know about it because I have been (on another programme), Right? It (this course) didn't teach us that the skills and sub-skills of reading (*incomplete*) Because even if you want to teach reading from the holistic point of view, you still need to know the skills and the sub-skills of reading because when you, when they tell you to cast your skills as strategies, you use certain strategies, but still if you don't know what the skill is all about, then you cannot teach it and that was not brought out in the course. You understand what I am getting at?

SN's comments are calling into question the underlying thesis informing this course, namely that reading and writing are best taught using a collaborative, integrated, holistic approach. The student herself is of the view that greater consideration should be given to the skills approach to the teaching of reading within the holistic framework that is being advocated in the course. Her hesitancy in making her comments, as reflected in the number of incomplete sentences, suggests that she is aware of the far-reaching implications of the criticisms she is making and that she is caught between being open about those criticisms and acknowledging the authority of the lecturer's knowledge claims. Indeed, her final question, 'Do you understand what I am getting at?', coupled with the quizzical facial expression accompanying it, suggest that she is making considerable effort to articulate a perspective that is internally persuasive, while at the

same time displaying some awareness of the need for propriety.

As far as SN's control position is concerned, the fact that she actually questions the accepted wisdom shows that she is capable of altering the power relationships at least temporarily in the context of a specific issue. She does not accept the new knowledge as given and demonstrates that she is capable of penetrating and analysing it.

Essentially she is demonstrating that she has the personal power to assume some degree of responsibility for her learning. However it would seem that the teaching-learning environment in which she is functioning is not providing the quality of support needed for her to display the learner independence of which she seems capable. The integration between power, independence and support which Garrison and Baynton (1987) regard as the defining characteristic of their model of learner control does not appear to be present here.

What these two episodes reveal is that for SN, learner-knowledge interaction involves an inherent commitment to the act of meaning-making. At the same time one notes that her capability to engage in this act appears to be restricted by the prevailing hierarchical social setting of which she is a part and which she does not seem willing to challenge completely.

Conflicting conceptions

The above examination of the relationship between the transmission and assimilation of information raises a further issue. It would appear that the teaching-learning interaction does not allow for the airing of conflicting conceptions of the topic being studied. One recalls that Laurillard's (1993) Conversational Framework accords high priority to teacher and learner description of their respective conceptions of the topic goal. In the case of the two students highlighted in this section, one of them does not seem to be aware of the areas of conflict in her own thinking while the other, although able to recognise differences between her conception and the lecturer's, is reluctant to acknowledge this fully.

This situation refocuses attention on the construction of the teaching discourse and on the way it influences the knowledge building processes of the learner. It can be argued that the authoritative nature of the teaching discourse, as discussed earlier, may be having the effect of restricting rather than facilitating the airing of learners' conceptions.

Summary discussion

Based on the data analysed, it would appear that where the language used for the transmission of information was constructed out of generalisations, recommendations, opinions, student-participants of this study were likely to assimilate the knowledge claims of their teachers without questioning, and in addition, would even adopt the language style of the transmitted information.

Notwithstanding the above, student-teachers in the study also showed themselves capable of using their own prior knowledge to examine the newly presented knowledge with a view to determining its viability.

In the context of the transmission and assimilation of information in this study therefore, learner-knowledge interaction is revealed both in the unquestioning assimilation of external knowledge claims as well as in attempts to construct a viable and meaningful knowledge base.

Internal negotiation

Both Harri-Augstein and Thomas (1991) and Jonassen et al.(1994, 1995) draw attention to the part played by internal processes in the individual's construction of knowledge. Harri-Augstein and Thomas talk about the inner conversation and Jonassen refers to internal negotiation. I interviewed Group A students on the same topic of evaluation and assessment and the response provided by one of them highlights some important issues regarding internal negotiation. As with the preceding interviews transcribed, OK refers to the researcher, and the other abbreviation (MK), to the student.

- OK Now, one of the things that the lecturer said was that the present approach to assessment makes students too dependent on grades and test scores. And she was putting forward the view that students must develop their own self-assessment skills. And with some of the new approaches to evaluation and assessment, for example, she mentioned portfolio assessment, they provide opportunity for students to develop the ability and the know-how to assess themselves. So, what I am asking you in relation to that principle is, how does this view about students assessing themselves, fit with you?
- MK I think you should let it pause (tape recorder).
- OK I will let it run.
- MK The portfolio, I am thinking about my classroom situation. Because I have little children, infants and beginners. So I don't think... No, I can't ask you that. But are they really capable of assessing themselves, or are you talking about developing that?
- OK That skill. Why do you think they are not capable of assessing themselves?
- MK I don't think they are, you know. Okay, well, you see I am thinking about two groups of children. I am thinking about the beginners who have never, they have never, *(change in tone of voice, as if talking to self)* Children are able to assess themselves. I...
- OK Go ahead, go ahead.
- MK I am not sure what answer you are looking for.
- OK It's not what answer I am looking for at all, at all, at all. You work it out. You will say things that contradict each other. I suppose.
- MK I suppose.
- OK Right. Which means you are just like me.
- MK I am trying to remember the lecture as well. Ahhm, the portfolio... You see that's when I don't do my reading too, eh? Sometimes I don't. Why don't we do this in a group. I always have FS and CH to sit with me, so...
- OK Go ahead.
- MK What was your question again?
- OK How do you feel about the idea of students assessing themselves?
- MK I feel children should be able to assess themselves. I wasn't sure... They should be able to and it is good because when they do, they know where they are at. I, as a teacher, may think I know where the child is at, but only the child really

knows what he is capable of doing. And he may be able to tell me, 'This is where I am at and I need help from here'. Whereas I may see... I remember another lecturer was talking, she said we may give some form of evaluation and a child may get 100% but it doesn't really mean that he understands what has happened. He has probably just found a way of getting the right answer. I don't know if I am answering your question. I don't want to mix up myself, but exactly how I can...

OK You were, initially you had some problems with the age of some children, your beginners. And you had some queries about they being able to assess themselves. Do you think that you could develop in them the ability and the know-how to assess themselves?

MK That's what I am thinking about. (*Pause*) I am not sure if I am capable. Maybe if somebody comes, may be if you (*incomplete*), they can give me some guidelines, I would be able to(*incomplete*). But I am not certain. I might think, who am I to really know? My problem is knowing whether I am doing the right thing or not. So I don't think I am answering your question here, you know.

OK Go ahead.

MK I am thinking, too, the child is also hearing impaired, Right? Maybe I should have gotten clear what is meant by assessing oneself and then...

OK There is a piece of work, there is a set of work being done over a period of time. And they have to know, well, 'I am doing okay. I am able to do so, so, so. This area is not too strong and the reason why I am not too strong here is because (*incomplete*) Maybe I should ask my teacher...

MK What you are saying is that I, as the teacher, I have to guide the children. He cannot on his own, I don't think, be able to know, (*change in tone of voice, as if talking to self*), Something is not right in my head with that.

OK He cannot of his own be able to do (*incomplete*)

MK But he can. I am thinking as a child, I should be able to know whether I have, But it is only through interaction with my teacher that I would know that I am doing well. From, maybe work that comes after, I'll be able to judge. 'Well, yes, I am doing okay, because I have met the standard, you know. Yes, in that, in that (*incomplete*)

OK So you think the teacher has a role to play in building that (*incomplete*)

MK Definitely, yes.

OK Okay.

MK It took so long to get to that point.

OK It works like that sometimes.

The struggle within

A significant feature of this interview is that MK does not appear to be able to recall any session in which she would have been exposed to the ideas that I was raising. Indeed she was not present at the session at which I had recorded the information used in the interview. While this can be regarded as a disadvantage on one hand, on the other it can be seen as an advantage since the student is being required to generate a response to the issue without having previously been exposed to the perspective of an authoritative source.

The disjointed nature of MK's participation in the interview is worth noting. It is clear that she is engaged in an internal debate and is struggling to formulate her response. It is likely that this internal debate has arisen, as she says, because 'I am not sure what answer you are looking for'. In fact she talks about her uncertainty about how to respond three times in this episode. No doubt, in her mind, there is a 'correct answer' to the question. She is probably also blaming her perceived inability to formulate the correct answer on the fact that she does not remember the relevant lecture and that she has not been keeping up with her reading. What this suggests is that, for MK, a response is appropriate when it is seen as being close to the knowledge claims of an authority figure.

One notes that when her response is in agreement with the perceived official perspective, namely that students must be able to assess themselves, her manner of delivery is smooth, sustained and confident. Nonetheless, her doubts are never far away and would surface from time to time. Indeed the doubts are present from the outset; she would take a long time before responding, requesting instead to have the tape-recorder put on pause. After an uncomfortable period of silence she says, as if thinking aloud,

The portfolio, I am thinking about my classroom situation, because I have little children, infants and beginners. So I don't think (incomplete) No, I can't ask you that. But are they really capable of assessing themselves, or are you talking about developing that?

Even though she does not openly say so, MK seems to think that the ideal of learner self-assessment must be considered in relation to the age of the learner. Age of learner apparently constitutes a barrier to her acceptance of the notion of learner self-assessment and it appears that she is having difficulty overcoming the barrier. In addition to the difficulties associated with age, she also has problems regarding her own competence as the teacher to facilitate the development of self-assessment skills in her pupils. In this regard she says, as if thinking aloud,

I am not sure if I am capable. Maybe if somebody comes, maybe if you (incomplete), they can give me some guidelines, I would be able to. But I am not certain. I might think, who am I to really know?

A third area of doubt relates to the fact that her students are hearing impaired. She seems to be wondering whether this disability may not also be a relevant factor to be considered. Ultimately though, she firmly asserts that pupils can assess themselves in interaction with a teacher.

A shift in perspective

On reflection, it would seem that her culminating position on the issue of learner self-assessment may have been influenced by my intervention in response to her expression of doubt about whether she had fully understood 'what is meant by assessing oneself'. She cued into my reference to the role of the teacher and used that reference as the basis for her subsequent remarks. In an immediate reply to my comment, she observed,

What you are saying is that I, as teacher, I have to guide the children.

In a later moment of reflection she casts herself in the role of the student and makes the point that,

But it is only through interaction with my teacher that I would know that I am doing well.

This line of thinking culminates in a firm assertion ('definitely, yes!') in response to a further comment from me about the teacher facilitating learner self-assessment. This confident assertion seems out of character when viewed alongside her prior remarks on the topic. In the earlier part of the interview, as noted above, MK had expressed doubts about her own capability as a teacher relative to the task, and about the ability of beginners and hearing impaired students to engage in this task. One cannot but wonder as to the factors that could have influenced this change in perspective.

Her final statement is more an imposition on rather than an evolution from these initial thoughts. However hesitant, disjointed and undeveloped her articulation of those initial thoughts, what they reveal is that she is engaged in an internal dialogic process to arrive at a perspective on the issue of learner self-assessment that is personally valid and meaningful. Simultaneously though, this internal dialogue always seems to be seeking the intervention and approval of some external authoritative voice, be it the voice of the course lecturer ('I am trying to remember the lecture as well') or the voice in the readings ('You see that's when I don't do my reading...') or the current voice of the interviewer ('I am not sure what answer you are looking for'). Ultimately, one of the external voices (mine!) is drawn on, not to facilitate the dialogue, but to suppress it. What this reinforces is the issue of control as a factor within the knowledge-building process itself and not only as an attribute of the social environment supporting learning (Pietrykowski, 1996).

Other issues

Two other issues emerging from this interview also warrant attention. First, in addition to calling for the intervention of the voices referred to earlier, MK expresses a preference for a group discussion rather than a one-to-one interview. She says, 'Why don't we do this in a group. I always have FS and CH to sit with me'. This desire to work in a small group setting to explore ideas seems consistent with findings emerging from the survey data, regarding choice of setting relative to learning tasks. The students of that study seemed to favour the individual with two or three other students for

discussing issues arising out of the readings.

Secondly, like Lecturer B in the episode analysed earlier, and like the student of that group as observed in the interview situation, MK contextualises her discussion of the topic of evaluation and assessment. In fact of the three, MK is probably the most specific in defining the boundaries for her engagement with the topic. As she is exploring the issue, it is as if she is also conjuring up a visual image of her own classroom. In fact at one stage she actually says, "I am thinking about two groups of children". These turn out to be beginners in primary education and children with a disability.

MK is contextualising, not in the broad sense of a typical classroom, but in a very focused, specific sense, confining her treatment of the topic to the specific settings with which she is familiar. One gets the impression that she needs to attach the issue to the concrete situation in order to engage with it mentally, a feature of the learning process that is strongly advocated by constructivists as well as by the proponents of situated cognition (Brown, Collins and Duguid, 1989).

Summary discussion

Three features regarding learner-knowledge interaction emerging from the analysis of this episode are worth noting.

First, voices from external sources infiltrate and can influence the direction of this internal dialogue (Maybin, 1994). Of interest in this regard is the fact that this can occur even when there is no direct external intervention related to the area of knowledge that is the focus of the dialogue. Also of interest is that attempts by an external voice to assist the internal conversation can result in that voice dominating rather than facilitating the process.

Secondly, one notes the insistence of this student-teacher to situate her engagement with the new knowledge within a clearly defined work-related context. It is as if she needs to manipulate the knowledge within an environment with which she is familiar in order to make sense of it.

In the final analysis, the most important feature is that the student's internal struggle demonstrates that knowledge building involves a conversation with the self whether or not that conversation is conducted in an overt manner as is the case in this interview.

Building knowledge from an argument

In the first two sections of this chapter, I highlighted information transmission as a knowledge-building activity performing an essentially presentational function in the teaching-learning context. The lecturer was presenting a body of subject matter content to be received, decoded and assimilated by the students. In addition to that type of use, there was also evidence of the act of information transmission being used to construct an argument with the intention of convincing the hearer to support a particular point of view, rather than another.

Lecturer A spent part of a session comparing two perspectives on teaching, namely 'teaching as telling', and 'teaching as probing'. There was only a brief off-line reaction by one of the two students present at the site at this stage. For the interviews, I prepared an audio-recording of a segment of the lecturer's contribution and played it back to all students of the group to solicit their response to the lecturer's position.

The data presented below was drawn from the interview conducted with DN who was one of the two students present at the session.

OK (*in interview*) I want to get your reactions to a segment I recorded from a session. It's just (the lecturer) talking and I want to hear any reactions you have, whether to the content or to style or anything like that.

Lec. (*on tape*) In class today... we were reading an article and it had to do with personalising study, children finding out things for themselves. And one of the students said that what it does for him was to make him reflect a bit on what instruction means. Because based on the article, the children were given limited instruction and they found out things for themselves. They did not need the teacher as an instructor per se, in the traditional sense. So that they didn't need the teacher to do what Site B was talking about, telling them. Because you know how we take teaching to mean instructing, to mean telling. They didn't need the teacher to do that. What they needed the teacher to do was to probe, by asking questions and the children were able to find out the answer for themselves.

- CL (to DN; off line comment, on tape) That's kind o' hard, yuh know.
- Lec. (continuing on tape) So we should back off from the telling and make sure that we set up the environment right, ask the right questions and guide the children so that they make their own discovery.
- OK (in interview) Okay, so what is your response to that statement?
- DN Remember I said before, I don't like to study. I am the way I am now because of the fact that my teachers told me everything. I never, I always believed... and even now I believe that the lecturer or teacher should come and give me all the information. Why should I have to go and look for it and think about it. That was the way I was taught when I was growing up. That's how the system was then. The teachers came in and they gave you information. They told you where to find the information... So I am one of those people who write every single word that comes out of the teacher's mouth... I know that is bad and I know that is probably one of the reasons why I don't like to study now. At this level it is more critical thinking that I have to use and I have not been taught or trained to be a critical thinker... I realise that we cannot just tell the children because we don't give them the opportunity to think. And you realise now the way the world is going now, children have to be able to think for themselves because everything is moving so fast. So yes, I believe that you should not give too much information. Let those children (*incomplete*) Question them. That is the only way for them to want more knowledge and want to learn, when they have to probe to find.

The audio-taped insertion into this interview presents Lecturer A developing an argument in favour of 'teaching as probing' and against 'teaching as telling' She has built up her argument out of a statement made by a student in another situation. Drawing on that student's definition of instruction, she constructs her argument using a loose conversational style.

Constructing the argument

The argument begins with a statement of fact about a reading activity in the other situation and the remark made by the student in that context about the concepts of teaching and instruction as discussed in the article being studied. However she (the lecturer) soon appears to relinquish the student as intermediary between her and the article and is referring directly to the source. Her statement,

Because, based on the article, the children were given limited instruction and they found out things for themselves,

suggests that she is moving away from a situation of reporting another person's views and instead expressing her own. Another point worth noting about the above sentence and the two following it, is that they appear to be presented as statements of fact. The introductory phrase, 'based on the article', essentially serves to establish the authority and even the accuracy of the accounts being reported. Even though the article is not adequately referenced and in fact remains unnamed, it is presented as the source of information which students are expected to accept as true.

The lecturer then appears to be moving towards a position of assuming part of the responsibility for the statements she is making. The opinion (expressed as if to be taken as a fact), 'Because you know how we take teaching to mean instructing, to mean telling', brings the discussion into the world that she and the students occupy. At this point though there is a return to the world of the article. The value of 'teaching as telling or instructing' is immediately established on the authority of the article. She says "They (the children in the article) didn't need the teacher to do that (instructing)". By contrast, she establishes 'probing' as what the children in the article needed, so that they could 'find out the answers for themselves'. Thus, having devalued the 'instructing' perspective on the authority of the article, she turns attention to the 'probing' perspective and states the benefits to be derived from it, again on the authority of the article.

By combining her own opinion with events purportedly reported in an article, and simultaneously juxtaposing perspectives on the respective interpretations of teaching, the lecturer is able to build up an argument based on a basic cause-effect structure which holds that when teachers probe, children find out answers for themselves; and, by implication, when teachers tell or instruct, children do not find out answers for themselves. Based on the authority of the article, the former is presented as the preferred option. Hence she summarises with the recommendation, 'We should back off from the telling...'.

Responding to the argument

Even though, DN's response during the interview is the focus of attention in this analysis, a comparison with CL's immediate spontaneous reaction in the real-time interaction is worth noting. CL rejects the lecturer's position, DN in the interview accepts it. CL expresses her view in a single, brief sentence. DN makes an extended presentation during the interview. In spite of these clear differences however, there is a fundamental similarity between the two responses: both reflect an either-or approach to dealing with an argument: one either accepts the point of view that it is advancing or one rejects it. This issue will be expanded on later.

Of interest is the nature of DN's spontaneous reaction to the argument as it is represented in the interview situation. Even though the lecturer (on tape), is dealing with the topic of teaching as it applies to the professional practice of the student-teachers on the course. DN chooses to interpret it as a statement about her own personal approach to learning. It is as if she needs to acknowledge personal guilt as a learner before she can address the issue of teaching as probing from the perspective of the teacher.

When she eventually gives the issue her professional attention, she expresses her total support for it and uses the rest of her response to reinforce the position she has taken. Ideas and information used for this purpose are drawn from situations which she regards as demonstrating the appropriateness of the position. Hence she firmly asserts.

And you realise now the way the world is going now, children have to be able to think for themselves because everything is moving so fast.

Then she simply re-states the lecturer's position with a further assertion that the 'probing' approach will help the children "to want more knowledge and want to learn".

Both CL and DN are treating the argument as a closed entity. One rejects it, the other accepts it. Notwithstanding her extended talk, DN does not make any attempt to open up the argument and analyse it. Rather what she does is use a series of unsubstantiated claims to justify her support for the 'probing' perspective.

DN's strong support as expressed during the interview, contradicts the stance she appeared to adopt during the session. At that time, she seemed to be supportive of her colleague CL who was clearly objecting to what the lecturer was saying. One may infer two possible explanations for DN's likely shift. On the one hand, with the benefit of time, she has probably thought more carefully about the matter. On the other hand, it is likely that she is ambivalent about it. If there is ambivalence, its roots probably lie in DN's dissatisfaction with her own approach to learning. The forceful language which she uses at the start of her response to describe her own apparent shortcomings, suggests that she subscribes to an ideal but at the same time considers herself as not living up to that ideal. This is reflected in the statement,

So I am one of those people who write every single word that comes out of the teacher's mouth... I know that is bad ... At this level it is more critical thinking that I have to use, and I have not been taught or trained to be a critical thinker.

The contrast between her perceived objection during the session and her clearly stated support in the interview may lie in this conflict which she is experiencing between the self as learner who is not a critical thinker, and the self as teacher who recognises her obligation to uphold the ideal of teaching as probing in the interest of the children she is teaching.

It is also likely that the way the lecturer's argument is constructed in the first place does not provide DN with much assistance in dealing with her dilemma. The argument is itself presented as a closed entity. Its cause-effect structure does not invite analysis, hence as was noted earlier, one either accepts it or rejects it. Even when there is extended talk, this talk is built around the outside of the argument to support it. In spite of her profuse outpourings, DN does not generate any talk that could penetrate the argument and examine it from the inside. Apart from blocking examination of the argument in its own right, this closed cause-effect structure also militates against DN being able to explore her own dilemma as learner and as teacher.

Summary discussion

What is evident is that the cause-effect approach to reasoning reflects the key characteristics of the one-way transmission mode examined earlier in that it tends to communicate as dogma that ought not to be challenged. Thus it can be argued that this type of teaching discourse, like that used for straight information presentation, serves to help the teacher to maintain a dominant position in the interaction and by extension, to make it difficult for the learner to emerge out of a state of subordination.

Of particular interest is the likely association between a perceived inability to penetrate and analyse the argument presented and an apparent resignation to not being a critical thinker. I have suggested that the lecturer's treatment of the argument militates against the student's ability to attempt to resolve the dilemma between the self as learner and the self as teacher. In essence therefore, I am contending that the student's treatment of the issue of 'teaching as probing' seems to imply that for her, there may be a link between depth of engagement with knowledge and level of self-concept.

Critical analysis

As noted earlier, treatment of the content of the course was not restricted to the transmission and reception of information. In the sessions observed, and particularly in the Group A sessions, there were also teaching-learning exchanges intended to facilitate higher order engagement with course content. Three observable features of these sessions were that they were based on articles that the students were supposed to have read, that they were apparently intended to deal with knowledge at a more abstract level rather than as directly related to practice, and thirdly that they required students to manipulate the knowledge at a level beyond recognition, comprehension and even application.

In one session Group A students were expected to compare the attributes of two articles they were supposed to have read. One of the articles had been discussed in a previous session. The other would have been discussed for the first time in the current

session. The following is an episode extracted from that discussion. It is important to note that the exchange was conducted against the background of very acute transmission problems. The sound quality on the audioconferencing system was poor and at one point, the student at the other Trinidad site was cut off for a while. Lecturer A therefore had to manage the interaction in conditions that were far from ideal.

After a student from another site had summarised one of the articles, the lecturer initiated the following discussion. In order to maintain continuity, inputs from students from other sites have been included.

Lec. Apart from the subject area, how does this article differ from the one by Hartman and Kretschmer? How does it differ? *(pause)*

Lec. San Fernando?

VN They are the same in that they are both concerned with linking previous knowledge with what is to be taught.

Lec. hmm.

Site B Both articles move from the concrete to the abstract.

Lec. Alright.

DN *(DN is browsing through her reading materials; it appears that her browsing is being guided by the on-line exchange).*

Lec. Is there a specific study reported in this article or are the authors drawing from a series of studies... Is it a theoretical paper? What do you think? How would you describe it? *(long pause)* Is this somebody saying, 'I did this, I believe in teaching Maths. from the concrete to the abstract and this is how I go about it'. And you have reported the methods you use and your findings and you have a discussion. Or are they saying, 'These are the problems in Maths, teaching the *(unclear)* children to learn mathematics. These are some suggestions. You could do it this way'.

DN *(DN is still looking through the reading materials. She is going back and forth through the pages of more than one article, sometimes pausing for brief moments on a specific page).*

Lec. *(after another pause)* I'm asking which of those is it. Would you say it is a *(unclear)* that it is based on some specific empirical work *(unclear)* that a study was conducted by Hartman and Kretschmer? Are they the same kinds of articles?

Site T Are you considering the Hartman and Kretschmer article or the one on Maths?

Are you talking about two Maths. articles?

Lec. *(slightly exasperated tone in voice)* I am talking about the Reading article and the Maths article. I am trying to see if you can pick up any contrast... You are talking about similarities.. Apart from the content area, how do you say, how else do they differ?

Lec. *(after pause)* They offer strategies. Both offer strategies. Is this article... Is there any evidence (in this Maths article) that they taught using the strategy and reported the results as was the case in the Hartman and Kretschmer article?

DN *(DN seems to have settled in to more detailed reading on a specific page of one article).*

(There is a response from a student from another site and the exchange begins to flow more smoothly. The lecturer is no longer re-phrasing the original task statement. Rather she is now posing questions geared towards eliciting more focused responses, based on her assessment of a preceding response).

Lec. Alright. Are the practical strategies that are outlined in the paper, do you find that they have any kind of theoretical base?

.....

VN *(She explains that her microphone was not working for a while and asks for a repeat of the question).*

Lec. What is the theoretical framework behind the strategies that are being suggested here in the article?

VN Yes, it is theoretical, although the writer, what I'm saying is, it's not that this study was done for this paper. The writer was giving his experience and based on that he was able to develop this paper.

Lec. So this is based on part experience, part theoretical information, and coming up with these strategies, suggestions as to how they could be used. I was trying to get you to look at differences in the articles you read...

Learner response to task

This approach to the study of the reading materials was not new to the students of Group A. In the subsequent interviews, some of them mentioned that it was a regular feature of the sessions and in fact, they considered it a worthwhile and beneficial aspect of the overall teaching strategy of the course. Two of the students provided additional assessment. Both their comments were made as extensions of the discussion on note-

taking. In the interview I asked DN whether there was any input that was particularly hers in the notes she made. (DN is the student who, as noted in the preceding section, described herself as not being a critical thinker). She replied,

DN There isn't any input from me. That is one of the things I know is a problem with me. That's why, when I go to classes and lecturers don't give information, I find they are not good because they are not giving me anything to write. I don't like lecturers who come and ask you to think. And they will ask probing questions, and the whole session will just be questions. questions, questions. The lecture goes on only if you answer and if you don't answer, it doesn't go anywhere. I hate that.

VN, also of Group A, was less judgmental and more analytical in her assessment. She observed,

VN (Another lecturer) may give us notes at times if we don't have the reading material but (this lecturer) usually tries to get us to talk, so she would ask questions and have us talk, or she would try to get us to talk for most of the class. It doesn't always work.

OK I was just going to ask you that, because I realise that she asks questions all the time.

VN But it doesn't always work.

OK Why? From your point of view.

VN People do not want to express their opinions. I don't know if they think it is wrong or what. They just would rather have another site go first. So, if she asks, everybody shuts up. Nobody would volunteer an answer.

OK I realise that that happens. You feel that people don't know.

VN No. They just don't want to go first. That's all. If another site offers an answer, usually someone would say, 'Well, I don't agree or I agree with this or that.' By that time, people would have time to think and they would come up with other points. But people don't like to go first.

OK You think it is something that (lecturer name) does or you think the fault is on your side.

VN No. I don't see (lecturer name) doing anything particularly wrong. I think sometimes people may read the material long in advance so that when they come and a question is presented off the bat, they know they saw it somewhere but they don't know exactly where. They have to look back now, see what they have there. So you need a little time to think and come up with the response.

Whatever the reason, these two students are agreed that at times, there were problems when the lecturer attempted to encourage discussion among the students.

Learner performance of task

It is evident that students are not prepared for the reading-based task as set out in the above episode. Given the length of time DN spends browsing, it is likely that she is not very familiar with the articles. At no point in the discussion does she make an input. In fact the frequency of the pauses overall suggests that like DN, students at all sites must be devoting a considerable amount of time in private preparation for the task, either reading the article for the first time or trying to examine it from the standpoint of the question posed. Whatever the situation, none of them seems able or willing to attempt the task.

Consequently at regular intervals, the lecturer finds it necessary to reformulate the task. In the first re-phrasing, she eliminates one of the articles from the question and provides a cue of the expected response to this rephrased question. When there is no response, she again re-phrases and this time, virtually provides the answer to the preceding unanswered question, within a true-false question format.

The pattern that emerges therefore is that in this episode a large proportion of the time of the respective participants is taken up either attempting to formulate an appropriate task statement or attempting to get involved in the task rather than actually carrying it out. Control in the interaction breaks down at regular intervals and the lecturer's attempts to re-establish it, by re-phrasing the task, often flounders as the students continue to experience difficulty in taking their turns in the exchange.

However the lecturer persists and eventually responses begin to emerge from students at the other sites. VN, at the other Trinidad site, who was cut-off for a while, re-enters the discussion and asks for a repeat of the question. The lecturer repeats the question being currently discussed but the response that VN provides at that point is really linked to a much earlier question and not to the immediate one. At this point the lecturer summarises and closes the discussion.

Task-related skills and mental models

In setting the task and subsequently virtually doing it herself, the lecturer is demonstrating that she has the skills required for the task. In the first instance, she is aware that a piece of academic writing possesses attributes other than those embodied within its content, hence the type of question posed. Moreover she has some knowledge of the nature of at least some of those non-content related attributes. Specifically, she is aware of the properties of an empirical study and those of a theoretical paper and can distinguish between the two. She is also able to recognise the relationship between theory and practice as embodied in a single piece of academic writing and to see how the former provides a framework for the latter. Overall, the lecturer's approach to questioning reveals that she has knowledge of the conventions that govern academic writing as well as the skill to manipulate these conventions.

This body of knowledge and skills can be regarded as constituting the lecturer's mental models relative to the task of analysing academic writing (Jonassen et al., 1994, 1995). Further, based on available evidence and, technical problems notwithstanding, the students did not possess these mental models at the outset of the task, neither were they able to develop them as a result of their involvement in the task.

For example, DN never goes beyond the apparently inefficient and non-productive flipping through the pages of the reading material, an act that suggests that she may have been continuing to focus on the content only. VN, on the other hand, is able to generate a response to the initial task statement. However the responses that she and a student from another site give at the beginning are both content-bound. VN recognises the theme of linking new and old knowledge in both articles and the other student, that of the movement from the concrete to the abstract. Nonetheless they both demonstrate some limited capability to abstract from the specific.

Towards the end though, VN is able to make the transition from content to form and structure. As noted earlier, she is really answering an earlier rephrased question, which included the specific question 'Is it a theoretical paper?'. The entire question was,

Is there a specific study reported in this article or are the authors drawing from a series of studies ... Is it a theoretical paper? What do you think? How would you describe it? (long pause). Is this somebody saying, 'I did this, I believe in teaching Maths. from the concrete to the abstract and this is how I go about it'. And you have reported the methods you use and your findings and you have a discussion. Or are they saying, 'These are the problems in Maths., teaching the (unclear) children to learn mathematics. These are some suggestions. You could do it this way'.

The lecturer's subsequent remarks seem to indicate that she considers VN's response appropriate to the question to which she, VN, was replying. However given the explicit nature of the cues that the teacher provides, it can be argued that VN's response demonstrates more of a recognition capability rather than one involving higher-order cognitive skills as required by the original question.

Two issues emerging from this discussion warrant further attention. First, it appears that there are levels of knowledge within the subject matter domain that are not easily recognised and/or understood by the students. Students seemed to be experiencing difficulty in coming to terms with the notion of a *theoretical* paper as opposed to an *empirical* study. In fact, even though some sort of appropriate response was finally attained, one cannot be certain that VN or any of other student had fully grasped the characteristics of the two types of academic writing highlighted.

Secondly, the strategy used in this interaction, combining formulating a task, eliciting more focused responses and the students themselves performing the task does not appear to provide sufficient support for learner performance in this type of task. Certainly it does not appear capable of providing the type of support needed to help students build the mental models required for the performance of the task set.

Participating in the academic discourse

While the reading materials normally formed the basis for this type of higher order learning activity in Group A, there was one instance when another learning situation provided the forum for this higher order thinking activity. Lecturer A was observed guiding DN through a sequence to allow her to generate a description of the ability levels of her pupils, using language appropriate for inclusion in the Outline of the

Unit Plan. DN had earlier indicated that she was not sure what she was supposed to write about her pupils' ability level in the Outline. It is against this background that the lecturer initiated this exchange.

Lec. My question to you is, I don't know your children. I've never been in your class. How many children are in your class?

DN Six

Lec. Give me an overview of the academic ability of these children?

DN The first thing that comes to mind is... their reading ability, that a lot of times when they are doing reading, they sign manually but at the end, they do not understand what they have read. And a lot of times, there are a lot of words in there that they do not understand, they do not know the meaning of. So a lot of times, the reading is, yuh know, not beneficial to them. I have to go back and explain...

Lec. Give me in one sentence that you could write... in your essay, in your Unit Outline.

DN *(reacts in mock irritation)*

Lec. Think about what we have read in the two articles... in the language unit.

DN (Lecturer), I didn't read those two articles. Let me think a little bit, OK?

Lec. *(rephrases problem outlined by DN for other students and sets them task to come up with one sentence).*

VN Poor comprehension skills.

Lec. Alright. *(pause)* Rephrase that so that you make a positive statement given the information that DN has provided us with.

VN Something has to be done on their comprehension skills.

Lec. Can you be a bit more specific? When you talk about comprehension... a lot of things come to my mind... I need to focus a bit more. I need you to be a bit more specific.

VN They need to read and internalise concepts.

Lec. Site A?

DN *(laughs nervously and mutters to herself), ...their linguistic... comprehension skills. (simultaneously, she is flipping through her course materials)*

.....

DN (*on-line*) They have a, their ability to recognise words, sight vocabulary is fine. But the internalising of it, the meaning of it is difficult for them to conceptualise.

Lec. Fine.

From this exchange, it can be assumed that the lecturer is making a distinction between the language of everyday practice and the academic language of teacher education. It can also be assumed that one of the aims of the course is that students should be able to make the transition from this discourse of real world operations to the discourse of the academic discipline of teacher education (Chambers, 1993). Consequently, in formulating the task, the lecturer draws attention to two articles as a source of support.

As far as DN is concerned, confidence gives way to insecurity as she is made to effect this transition. Her engagement with the task involves a sequence of stalling tactics as she seeks to prepare herself to realise the ultimate objective of the task, namely formulating a sentence. There is even a claim that she has not read the articles. Nonetheless there is a marked difference in the manner in which she describes the reading ability levels of her pupils before and after her engagement with the task. In spite of her initial resistance, she seems to have been able to draw enough relevant data from flipping through her course materials, from the input of her fellow student VN, as well no doubt from her own stored knowledge, in order to generate a response. Given the lecturer's positive feedback, it can be taken as an appropriate response to the task set.

In the intermediary dialogue between Lecturer A and VN, the lecturer seeks to elicit a more focused response to the task from VN. In that exchange VN moves from a response of 'poor comprehension skills' to one that states, 'they need to read and internalise concepts'. Eventually DN, who had originally made the request, generates a sentence. She states,

The have a, their ability to recognise words, sight vocabulary is fine. But the internalising of it, the meaning of it is difficult for them to conceptualise.

The sentence contains one expression that is specific to the language of reading skills, namely 'sight vocabulary'. She also refers to the pupils' ability to 'internalise' and 'conceptualise', showing that she can name the cognitive functions involved in the reading process. There is no doubt that DN has enough understanding of these terms to formulate a sentence that is adequately organised in terms of syntax and word meaning. However what is not clear is whether she herself has really internalised the meaning embedded in the terms she is using and is generating a response from a deep understanding of the relevant concepts, or whether she is simply displaying a skill at acquiring the jargon of the academic discourse and reproducing it appropriately.

Summary discussion

A core issue emerging from the analysis of both episodes is that the level at which students are engaging with the content of the course does not appear to be deep enough to allow them to perform adequately at the higher levels of the cognitive domain as required by the tasks set by the teacher. The surface level of understanding being displayed suggests that they may not possess the relevant mental models to guide the cognitive activity they must engage in, or that the mental models are not being activated. Further, the teaching-learning interaction does not appear to be capable of facilitating the building or activation of the appropriate mental models required for the performance of the tasks outlined.

In light of this apparent inability of the students to perform at the higher levels of the cognitive domain, two questions may be asked regarding the teaching strategy being employed? First, is the guided discovery method sufficient in itself to facilitate the type of learning required in this session? Secondly, can real-time, face-to-face interaction be relied on to support, on its own, complex cognitive activity of the type observed in this session? These issues will be explored further in Chapter 12.

Conclusion

This chapter was based on the proposition advanced by several advocates of constructivism that learners construct rather than acquire knowledge, whatever the setting in which learning is taking place. The chapter also recognised the act of knowledge construction as being the core activity of learner-knowledge interaction and as a result used these two terms interchangeably. In addition the chapter was based on the premise that the social interaction between lecturer and student carried the responsibility for supporting the learner's knowledge construction or interaction with knowledge.

Inherent in the latter proposition is the perspective that the power relations between lecturer and student exert some influence on the knowledge construction activity of the student and that the effect of those power relations are evident not only in the interpersonal communication between the two participants but even more fundamentally, within the knowledge construction act itself.

All of the above propositions were reflected in the data analysed in this chapter. For example, instances where students held conflicting conceptions of the topic being studied, whether knowingly or unknowingly, can be regarded as demonstrating the extent to which they were maintaining their own conceptions but, at the same time, taking on those transmitted by the lecturers, notwithstanding areas of tension between the two sets.

The fact that students could be observed holding on to their own conceptions within the teaching-learning interaction, does not necessarily imply that learner behaviour was characterised by high levels of autonomy. There was evidence of students reproducing not only the content but also the language structure of their teachers' transmissions. This situation was seen as reflecting a top-down relationship between teacher and student, with the teacher occupying a dominant, authoritative position and the student being the subordinate participant.

I am therefore suggesting that the resulting imbalance in power relations contributed to a situation where, in the knowledge construction process, students were not always engaging with knowledge in a manner that indicated an intention to make sense of and derive meaning from the knowledge they were manipulating. In addition where there was some overt indication that a student was capable of exercising some degree of independence in her own learning, one saw evidence in the behaviour of the student herself of the ever-present influence of the teacher thwarting rather than facilitating the development of that quality.

The data analysed provided adequate evidence to support the position advanced by some of the theorists cited earlier (e.g. Fairclough, 1989, 1992) that language is a key agent in defining the power relations among participants in an interaction. To a large extent, the recommendations, generalisations, opinions of the lecturer served to establish the authority of the knowledge claims being made in the information transmitted from the lecturer to the student. As noted above, one saw the effect of this authority in the way the student adopted not only the content but also the form of what was transmitted. In another instance, where a particular line of reasoning was being advanced, it is likely that the rigid cause-effect structure of the argument militated against analysis by the recipient, encouraging instead unquestioning acceptance.

Notwithstanding the above, the data also provided evidence of a student displaying the competence and the willingness to question the authority of teacher-generated knowledge claims. From the point of view of the language used, what is significant is the way this student had shifted away from the authoritative, prescriptive style of the teacher to a more descriptive, reflective style in order to articulate her perspective.

The data also provided evidence in support of the view espoused by other theorists that internal negotiation is an integral part of knowledge construction (e.g. Jonassen et al.). One student in particular appeared to be engaging in an internal struggle to formulate a position on the topic being discussed. The student herself admitted that she could not remember being present at a session when that topic was

addressed neither could she remember encountering it in her readings.

Two questions arise as a result of that admission. First, to what extent would the student have engaged in a similar activity had she been exposed to the thinking of the lecturer and the authors of the reading material? The second, as an extension to the first, in what way is the internal exchange affected by the presence or absence of some direct external influence in the form of a lecturer or text material?

Finally the data also appeared to suggest that mental models are specific to classes of cognitive tasks. The students observed did not appear to possess, or to be making use of appropriate models to support the specific higher order tasks they were expected to perform. On the contrary what was evident, was that both lecturer and students made use of strategies that could move their exchange to a conclusion and generate an outcome in spite of the difficulties encountered during the exchange. However, while the outcomes appeared to be consistent with the requirements of the task, and were assessed as such, they seemed to emanate from surface rather than deep engagement with the relevant subject matter content and therefore should not really be regarded as examples of higher order cognitive activity. As noted earlier, in an attempt to elicit a response from the students, the lecturer had begun to rephrase her questions in a true-false format. Responding to the question was therefore a matter of selecting the correct answer from the two options presented.

On the whole, it would appear that greater attention ought to be paid to the construction of the teaching discourse given the impact it seems to have on the individual student's knowledge-building activity.

CHAPTER 11

DEVELOPING THE SKILLS FOR CLASSROOM PRACTICE

Subsidiary research question:

What are the factors in the discourse that facilitate and/or hinder learners' development of efficient and appropriate strategies for classroom practice?

Introduction

This chapter examines the two knowledge building categories that have a direct bearing on classroom practice, namely *problem-solving* and *planning for the implementation of new methods*. In these categories the discourse was used to identify, describe and examine the methods and strategies that would be put into effect in the classroom. The focus here was on the development and use of skills to facilitate efficient and effective practice.

Problem-solving processes

As expected, the primary intention for introducing a problem situation into a session was to seek a solution to that specific problem. As mentioned earlier, problems were generated, on the one hand, by students who were seeking the assistance of the lecturer to deal with difficulties they were experiencing in the classroom. On the other hand, there was one example of a simulated problem which the lecturer had devised and for which students were required to generate a solution. Whatever the source, there was always a very specific situation to be addressed. Both types of problems are addressed in this section.

The student-generated problem

A student in Group A, CL, sought the assistance of the lecturer in finding a solution to her problem on the teaching of Wh-questions:

- CL With reference to the class that I have... where you have two children now coming in to the school system, two children who have been in the school system for just well, a term, and this will be their second term. I have a problem in that (*incomplete*) First ... I will tell you and then you will... make some suggestion and so on. If I ask a question 'Where is that? What is that?'. Or even a question like: a girl has just hit a boy, 'Why did you hit him?' I will not be getting an answer for that question. Okay 'why', 'what' and 'where', even 'who'. So I find sometimes what I may need to do, do once per week, is focus on objects in the classroom, like 'What is this?' before I go on to another concept. Because they have a tendency to get confused. So the problem that I have... from time to time, with reference to my questioning, I have to be kind of careful about the words, the kind of questioning words that I use. Like 'who', 'where' or even 'when'. They would not be able to understand that right now.
- Lec. Okay, why is it they are not able to understand it? Which of the 'Wh' questions do they understand?
- CL Okay. I have started questioning them on simple objects. 'What'. 'What is this; what is that?' I have questioned them on 'who' as well. So they know that 'what' refers to things and 'who' refers to (*incomplete*). Okay, that is just a basic sort of description for both words. So that they will be able to, at least, try to get a distinction between the two. Right? But to me to come from those questions to another I may have to take my time and do that, because I may confuse them.
- Lec. Why have you started with those two?
- CL Because 'what' is going to deal with okay, the sense of sight, 'What is this; what is that; what is on the board?'... And then also, I'm also teaching them vocabulary words. So that sort of meshes together. Also there are a lot of people, visitors coming to school from time to time. The theme that I am doing now is The Environment. So they need to distinguish things from people as well. So 'what' would refer to things, 'who' will refer to people. And also I thought that that was the most basic thing I could have started with, with reference to answering questions.
- Lec. Is there any other (*incomplete*) Okay, I accept the reasons you have given me. Is there any other informed, any clearer theoretical framework to rationalise why you have started there?
- CL You mean why I have started with 'what' and 'who'?
- Lec. Yes.
- CL Okay. The children they are at the level where things in the environment appeal to them. They first learn by their sense of sight. Therefore I thought it would have been best to start there. And then I could go on to other things.
- Lec. (*somewhat annoyed*) I mean, children understand words. I mean, from a

linguistic perspective (*incomplete*), or has that sort of thing gone out of your head?

CL (*surprised*) What? What did you say (lecturer name)?

Lec. (*laughing*) From a linguistic perspective, what is the appropriate (*incomplete*). I mean these are the basic question forms in the 'Wh' hierarchy. So it is appropriate to start putting a lot of emphasis on those question forms. It's the same thing I'm talking about, you know. I'd like to see you all apply things a little bit more. It's not that you are not aware of the information. I'd like to see a little bit more connection. Because you do know that it is much more difficult to understand what is required to answer the 'why' question than it is to understand the 'what' or 'who' question. Right?

CL Right (lecturer name).

Lec. So, if I ask you what sort of... theoretical framework you have for that, that's the sort of answer, the sort of informed response that I am requesting. Anyway fine. You have to start there. But that does not mean that... you cannot expose the children, or you should not be exposing them to the 'where' and the 'why'. One of the things I think we teachers do a lot of, we get the feeling that children are easily confused. Yes, at one level they are easily confused. (*The lecturer then refers to the experience of a 2-3 year old child who hears adults using 'why' and begins to use it, although not fully understanding it.*) So the term is used and they start using it without understanding the full meaning of it, before they actually internalise it. So although you are focusing on trying to help them to understand... the 'what' and the 'who', clearly you still should not shelter them from the 'why' and the 'where'... In terms of 'why' you can start with the very basic, with the basic cause-effect...

CL (*CL pays attention at the beginning of this explanation about the approach to teaching 'why' questions, but as the lecturer continues, her facial expression suggests that she is not in tune with what she is hearing. Eventually she turns to another student, shakes her head and mutters something to her. She then appears to be losing concentration*).

The issue of control

One of the features of this problem solving exercise is that since the problem was introduced by the student, it is the student who is setting the topic, and by extension establishing control of the interaction. However the advantage gained from setting the topic is undermined because of the type of topic that the student is using (or in Fairclough's words, the discourse type that she is drawing on). Essentially, CL is making a request of the teacher, asking for something which she is either unable or unwilling to provide for herself. According to the conventions governing the teacher-learner relationship in this institutional setting, the teacher has the power to choose whether or not to accede to the request as presented. In this instance the lecturer

chooses not to. Rather she sets about to reverse the control positions, drawing on the guided discovery method whose question-answer format allows her to gain and maintain control of the discourse.

The student's strategy

CL introduces the problem in a way that suggests that she has cast herself in a subordinate role in the interaction. She seems intent on keeping the description of the problem as close as possible to events as they actually occur in the real-life setting. This intention is evident in the change of approach which she appears to make soon after starting her account. As she begins it seems as if she is going through a process of deciding on the format she would use for the description. It is as if she is shifting from one train of thought to another. Thus she says,

I have a problem in that (incomplete). First ... I will tell you and you will make some suggestions.

The introductory incomplete sentence of this segment seems to be constructed in a way that could probably have led to a more formal account of the incident. Had she continued with this sentence, the phrase 'in that' could have led her into a more interpretive reporting of what took place. CL opts not to go in that direction. Thus there is a shift in approach to language use. She proceeds to give a description of events that at times includes the exact words that she used in the classroom context. For example, she says, "'Where is that? What is that' or even a question like - a girl has just hit a boy - 'Why did you hit him?'". Her reporting of the use of the 'why' question shows her actually resetting the scene that gave rise to the question, namely, 'A girl has just hit a boy'. It is as if she needs to re-enact the classroom scenario to ensure that the picture that she is painting for the lecturer is as close a representation of reality as possible, thus enhancing her chances of getting the best possible solution from the lecturer.

When this approach to describing the problem is placed in the context of the statement, 'I will tell you and you will make some suggestions', it would appear that CL is not willing to extend her role in this exercise beyond describing the problem and

requesting a solution. What is evident therefore is that, in spite of taking the lead and setting the topic, CL is entering the problem solving exercise from a position of dependency.

The lecturer's strategy

As noted above, the lecturer gains control of the discourse by introducing the guided discovery method. However it soon becomes clear that the reason for doing so is to alter the student's role in the interaction from one of passively waiting to receive to one of collaborating in constructing the solution. Thus she (the lecturer) embarks on a strategy to facilitate this. She extends the basic two-part format of *formulate task - outline solution* into a slightly more complex exercise that includes the analysis of the problem situation.

By taking control of the interaction, the lecturer establishes analysis of the problem situation as a key component of the problem-solving strategy. This knowledge-building act involves two interrelated functions namely the questions that she, the lecturer, asks and the answers which the student provides. The lecturer's questions are clearly aimed at guiding CL to examine the problem situation more closely and ultimately to help her arrive at a solution through that route. The first three interventions that she makes reflect this intention. By the third intervention, however it becomes evident that she is not satisfied with the responses she is receiving. Apparently she does not fully accept CL's response to her first question about why she, CL, has started with 'what' and 'who'.

The third question is a repeat of the second but with an expansion to clarify the intended meaning of 'why'. Thus she asks CL to provide 'a theoretical framework to rationalise why you have started there'. Her subsequent remarks about wanting to see students 'apply things a little bit more', and wanting them to make 'a little bit more connection' suggest that she is still not satisfied with the responses. In the end the solution that she outlines does not emerge out of the analytic process. One may infer therefore that the questioning strategy used to guide the examination of the problem

situation has not attained its objective.

When one examines the questions of the first three interventions more closely, it becomes apparent that all but one contain 'why' questions, indicating an intention to find reasons. The intention becomes even more articulated at the third intervention when the lecturer asks the student to provide 'a theoretical framework'. When this term is considered alongside the subsequent remarks about applying things a little bit more, and making a little bit more connection, it becomes apparent that the lecturer is requiring the student to make the theory-practice link. The single word 'why' in the preceding questions, 'Why is it they are not able to understand it?', and 'Why have you started with those two?', can therefore be regarded as being heavily loaded.

Student's understanding of lecturer's strategy

It is not clear whether the student is aware of the underlying intention in the lecturer's questions. In fact, one cannot be sure whether she has a sense of the direction of the questioning strategy. At one level, her responses are appropriate to the questions she answers. For example, in replying to the question, 'Which of the Wh-questions do they understand?', (and in the process, evading the more complex 'why' question preceding it), she appropriately states that her pupils understand 'what' and 'who'. She also offers the additional information that these are the two with which she has begun instruction. However one gets the impression that she may not always have been fully aware of the full import of the word 'why'. Ultimately though she becomes aware of the lecturer's intention and proceeds to respond to the issue of a theoretical framework. However, there is still a gap between her practical approach to theorising ('Children first learn by their sense of sight'), and the more formal, academic approach that the lecturer requires ('...from a linguistic perspective').

It also appears that the student is conscious of a loss of her original intention of getting the lecturer to provide a solution and she seems anxious to re-establish this as the focus of the interaction. In one of her responses, she seems to be performing the dual function of engaging in the process of analysis, as required by the lecturer, and at

the same time, attempting to re-orient the discussion to achieve the ends she had originally intended. Thus, after stating which 'Wh' questions her pupils understand, she offers her own additional assessment of the situation and in the process she repeats her concern about the children's confusion. It is as if she is subtly using the condition of the children to force the lecturer to accede to her request.

Ultimately though, as noted above, CL offers her version of a theoretical framework, which the lecturer does not accept. At this point control breaks down and the lecturer resorts to outlining a solution.

What is likely is that the process of analysing the problem situation may not have been optimally transparent to the student in that she was not always fully aware of the direction and purpose of the exercise. It is as if she was never a full and willing participant. Consequently there was always a sense of 'disconnectedness' in the interaction.

In addition the strategy employed did not seem to be capable of serving the purposes for which it was apparently intended, namely to facilitate the learner's greater understanding of the problem situation. While CL's answers could be considered appropriate to the questions posed, they were more oriented to explaining the current situation for its own sake rather than to getting an understanding of the problem inherent in the situation. Her answers, and probably also the questions that gave rise to them, were static rather than dynamic and were not adequately suited to advancing the process towards a solution.

On the whole, the exchange between the student and the lecturer presents a good picture of the struggle for control that Fairclough recognises in his concept of power in the discourse. What is also worth noting are the differing effects of the questioning strategy of the respective participants. On the one hand, the lecturer's questioning allows her to take control while that of the student simply reinforces her subordinate status.

The lecturer-generated problem

As noted earlier, there was also one instance when it was the lecturer who introduced a problem. The students of Group B were expected to review a story and a poem that were introduced in the previous session. In the current session the lecturer formulated a simulated classroom problem around the story and the poem respectively and set the students the task of generating a solution. The discussion regarding the teaching of the story is as follows:

- Lec.: (*Lecturer adopts a dramatic tone of voice and exaggerates 'f' sound in title*) You remember the story about 'Flynn, the flying fish?' (*She reverts to normal speaking tone*) You remember Flynn? (*She adopts dramatic tone again*) A great silence descends. (*She reverts to normal speaking tone*). Alright now. What I had asked you to do this week, and I am sure you've been thinking about it ever since last week, What would you do with this story in the classroom to facilitate students' understanding and how would you effect responses from students to this story? Who's been thinking about it and who would like to start? (*pause*) How are you going to teach this story in a classroom? (*pause*) I prefer you to volunteer.
- SN Okay, I want to do the part with the flying fish. If I am able to retell that story, to say it just the way you did it, with all... the dynamics in it and the voice modulation and what have you, I would ask the children to sit quietly, lean back and close their eyes and imagine as I tell the story. And when they are finished, I will ask for volunteers as to how they will interpret it... And from that, I imagine we can get some drama, we can have retelling of the story, we could have students making a dialogue, we could have art ... And we could ask them also to make up a story of their own.
- Lec. That's good. You said drama, re-telling, dialogue, art, make up a story. Choose one of those and give us a few details of what you would ask the children to do. What sort of task would you set them and what would you expect they might do.
- SN (*pause*) Well, I'll leave it up to them to decide what they want to do.
- Lec Alright.
- SN And they can form themselves into two groups. One group could do drama, one group could do whatever.
- Lec Alright. And, what would the teacher's role be in that situation?
- SN Well, you are helping wherever they need help. You'll try to facilitate and give them bits of advice. You could even make up some drama steps for them if necessary.
- Lec Alright now. One thing that occurs to me is that you would need to be very precise with the task. You can't just say to a group, well, you're going to dramatise.

SN I know, but on the spot like this, you didn't give me much time.

Lec You're doing very well (*laughs*) But it's because you're doing so well and nobody else would talk. Anybody else wants to talk about Flynn?... Give us some more details about what you might do in a class with this story?

.....

LW (Lecturer), whenever I think of Flynn, I always think of the younger children making mobiles of the flying fish in the art class.

Lec. Good. Alright. Anything more about the flying fish?

LA What I think I would like the children to do is to do the repeated line, the 'Flop'. I don't remember the line exactly.

Lec. Yeah.

LA Every time we reach to that part, I'll have them say those lines.

Lec. It's "He cries and he goes 'Splash, Flop'!"

Lec Lovely idea! One thing I haven't heard anyone talk about. In what ways would you try to establish that the children have understood the story? Now, I know that that is what you are doing with all the activities that you are suggesting. Children will show in the activities how much they have understood the story. But could we talk a little bit more about the understanding? What would you look for in the activities that have been suggested. For example in a drama, or in a piece of art. What would you look for to show that the story has been understood? (*pause*). Anybody?

LW For example, I think you need to show the fish with the wings. And you need to show the wings, see the fish jumping in the sea. I think this is one of the most exciting things about the story, how the flying fish got the wings.

Lec Good.

SN And then too, remember at first, he wasn't able to fly very high. So in the sequence of the story being dramatised, you find him jumping a little bit. And then each time, he jumps, he jumps a little bit higher. Until finally, he jumps the highest. And then the story ends.

Lec Is there a value that's being emphasised in this story that you might want to talk about with the children?

SN Well, persistence wins out in the end, or perseverance.

LA Yes, that.

Lec. And then when he begins to be able to fly, he goes 'Splash, Hoosshh!'. And you know how children love those sounds. Alright, unless someone wants to say something else, we'll move on to the poem.

The above problem-solving episode falls into two parts. In the first part, SN is drawing on her knowledge of how to teach a story. From her responses, it is evident that she is not adequately prepared for the task and that she is ad-libbing. As she herself admits, she was caught on the spot and was not given enough time to prepare. It is probably because of her lack of preparation, that she does not mention any details about the story itself. However eventually, there is a change in this situation. It is likely that other students were using the period of SN's exchange with the lecturer to review the story and refresh their memories of its content. For there is a shift in the students' treatment of the task. The responses are more content than skills-based. In the context of this episode, that shift is beginning to emerge from LW's suggestion that the children could make mobiles of the flying fish and it becomes even clearer when SN, now feeling more confident about her knowledge of the details of the story, recalls the section in which the fish is jumping higher and higher. On the whole, in the second part of the episode, there is far greater reference to the content of the story, with only passing mention of the story-telling strategies.

What the above indicates is that overall, students are drawing on two types of knowledge in their performance of this task. On the one hand, there is knowledge of how to teach a story, that is story-teaching skills. On the other hand, there is content-specific knowledge about the story itself.

Student treatment of the task

In the first part, SN lists the strategies that she would use in teaching the story, namely dramatisation, retelling of the story, dialogue construction and art. She makes no attempt to explain why each of these is appropriate or in what context each is to be used. Her responses give no indication as to how any or all of these strategies would be implemented to effect pupils' understanding of the story, as required by the task set.

Like Lecturer A in the preceding episode examined, Lecturer B also uses the guided discovery method to engage students in analysis of the problem situation. In this instance though, the object of analysis is not the problem itself, but the unexplained

solutions that SN is generating. In one intervention the lecturer asks SN to describe a task appropriate to one of the strategies she has listed (dramatisation etc.). When given the very arbitrary response of 'I'll leave it up to them to decide what they want to do', the lecturer probes further and asks what the teacher's role would be. The response to this question is equally vague. The lecturer is evidently dissatisfied, as reflected in the feedback that she provides at this stage. She says in part, 'You can't just say to a group, well, you're going to dramatise'.

As SN herself admits, she was not prepared for the task. There are three possible ways of interpreting the notion of preparedness. First, being prepared can mean becoming familiar with the content of the story. Secondly, it can imply the ability to develop and use knowledge of story-teaching strategies, and thirdly it can mean having the skills necessary for integrating the first two. No doubt it is the third level of preparedness that is required for optimum performance of the task set.

Treatment in the first part.

SN's contribution to the exchange in the first part concentrates mainly on listing strategies. When required to explore these strategies further, she is unable to do so. An examination of the answers she provides suggests that there may be substantial gaps in her knowledge base relative to the task she is attempting. If she is to identify and describe a task that reflects the use of drama, dialogue etc. she would first need to have knowledge of the attributes intrinsic to each of these strategies that can be manipulated for the purpose of teaching and learning. This would require an awareness of the distinction between drama etc. as artistic expression and as method for teaching and learning. Secondly she would need to be familiar with the story, not only at the level of its content but also in terms of its form and function. Thirdly she would need to be clear about the aims and objectives of story-telling in the context of the curriculum for the given age-group of pupils. Finally she would need to be able to draw on broader meta-cognitive skills to integrate knowledge from all these sources in order to generate the appropriate response.

Two areas of interest arise out of the above assessment of the requirements of the task. First, none of the above is made explicit in the interaction between the lecturer and SN in the first part of this episode. In fact there is little evidence that either of them is drawing on any clear body of knowledge to support performance of the task. Secondly, probably as a result of there not being a body of observable knowledge, there is no noticeable standard against which any outcome can be measured. What constitutes 'students' understanding' and 'effecting responses' are never made explicit.

Treatment in the second part.

If the first part of the episode can be described as tending towards a general-to-specific approach to the task, it is a more content-focused approach that is observed in the second part. The point of departure is the story itself. The pattern that emerges with almost all responses in this section is one in which there is a focus on some aspect of the story with some strategy loosely attached to it.

For example in her contribution in this section, SN highlights the fish being able to jump higher and higher and she makes a tenuous link between this piece of information and dramatisation. As noted earlier, SN seems to have switched from listing strategies to describing sections of the content. LA highlights the sounds that the fish makes and states that she will have her pupils repeat those sounds. In fact she is helped by the lecturer who not only clarifies what the sounds are but also demonstrates how the sounds can be vocalised. The lecturer herself fosters this approach of focusing on the story in one of her questions. She asks,

Is there a value that's being emphasised in this story that you might want to talk about with the children?

To this question, SN identifies the value, persistence, but does not bother to make any suggestions about how she would talk about it with the children. In the circumstances, this is not entirely unexpected since the structure of the question does not suggest that any importance should be attached to the teaching aspect.

LW comes closest to balancing the two types of knowledge. Using art as the medium of expression, she suggests that pupils can make mobiles of the flying fish. At a later point she seems to be expressing the view that children need to experience the flying fish in a form that gives prominence to the wings ('You need to show the fish with the wings'). Even though she does not explicitly make the link, it seems that her choice of the mobile-making strategy is influenced by the significance which she attaches to the wings. Also of interest in LW's contribution is that she is able to effect the general-to-specific mode of thinking in identifying her mobile-making strategy.

Two issues are worth noting about the approach to the task in this latter part of the episode. First, one gets the impression that, rather than construct a strategy in relation to the story as a whole, students are engaging in a one-to-one matching exercise, isolating aspects of the story and linking them to activities that mirror the attributes of the aspect identified. Hence the sounds that the fish makes are to be vocalised, the wings are to be modelled and the act of jumping is to be dramatised. It is apparent that students are adopting a fragmented approach in their treatment of the task.

Secondly, while the task of generating a strategy for teaching the story is the official focus of this exchange, students' appreciation of the story itself emerges at certain points as an important point of interest. At the outset, as the lecturer is introducing the task, she also seems to be setting the atmosphere to foster students' emotional engagement with the story itself. There is the variation in the tone of voice and the onomatopoeic effect which she obtains from emphasising the 'f' sound in the title 'Flynn, the flying fish'. Her own emotive response seems to be infectious as SN appears to be still moved by 'the dynamics and voice modulation' that accompanied the lecturer's reading of the story in the previous session. LW focuses on the wings because, in her opinion, 'this is one of the most exciting things about the story, how the flying fish got its wings'. LE, like the lecturer, is attracted by the sounds.

One gets the impression that consciously or unconsciously, students are being influenced to undertake the task within the framework of their own emotive response to the story itself. Thus in this second part, decisions about what to teach and how to teach

it are based on personal opinion and preference. While one can detect an orientation, however slight to be analytic in the first part, the tendency in the second part is towards the intuitive. Consequently one cannot be sure whether the primary motivating factor in this exercise is the learning of the pupils or the enjoyment of the teachers.

The lecturer's feedback

For her part, the lecturer continues to be dissatisfied with the students' contribution in this second part, in spite of her periodic positive feedback ('Good', 'Lovely idea'). Her detailed feedback shows that she is still seeking to re-focus students' attention on the essential requirements of the task. Thus she emphasises,

What would you look for in the activities that have been suggested? For example in a drama or in a piece of art. What would you look for to show that the story has been understood?

She eventually ends the discussion on the story but it is evident that the intended outcome has not been attained.

Summary discussion

This section dealt with problem-solving from two perspectives. In the first instance, the exercise was based on a problem introduced by a student and in the second, it was based on a simulated problem developed by the lecturer.

Two issues are worth noting in relation to both. First, it would appear that the guided discovery method, employed as a means of facilitating analysis of the problem situation, could not by itself activate the necessary problem-solving skills required for learner performance in the two tasks. In relation to the second task, it would appear that students did not have all the necessary knowledge required for generating a strategy for teaching the story. Their lack of familiarity with the relevant knowledge limited their capability to participate purposefully in the guided discovery strategy initiated by the lecturer.

In both tasks, students were required to apply theory to practice. However, they did not appear to be equipped to do this competently. They did not seem to have a clear perspective about how to identify and/or derive the relevant theoretical knowledge required to support or illuminate a specific practical operation. Further, the teaching-learning interaction did not appear to be able to facilitate this process. Based on this exchange, it would appear that there are gaps in this aspect of the training programme for these student-teachers.

Processes for introducing new methods

In some of the sessions, students were being introduced to new methods to be implemented in their classroom practice. In almost all cases observed, this type of interaction formed part of the preparation for the Practicum. As mentioned earlier the Practicum is an examination of classroom practice. The approach used involved naming a given method and demonstrating how it could be put into practice. This was the case when Lecturer A introduced students to the strategies for designing an integrated unit.

Lec. With regard to the scope of the unit, you are focusing on two areas. ... You will recall, a few weeks ago, when you were looking at the LaSasso article and the strategy used there, semantic webbing and we (*unclear*) and you move from that to see how you could get a variety of themes, a variety of topics. So taking one concept, for example 'cooking', and you can see how you can get the Science out of that, the English, the Language Arts, the Social Studies and so on. One of the suggestions is that, as far as possible, you could attempt an integrated approach and you know the advantages of that already. So we need not spend time discussing that. So even though you may have single subject listings in the work plan that you have, you can find a way of integrating that information so that children can (*unclear*) that information re-specific subjects in an integrated manner. So Site A, when you are looking at the scope of the unit, you are looking at whether you are doing an integrated unit, and the subjects you are integrating are Maths., Science, Social Studies, Language Arts. So in the integration, those are the subjects that are integrated. What you need to do in your scope (of the unit) is list the sub-themes within the integrated approach. You will recall in the LaSasso article, where a variety of concepts came up, something to do with heat, something to do with cost. These can be sub-themes that would reflect the variety of subject areas.

DN Do you have to integrate all the subjects or you can integrate a few of the subjects and do single subjects for the rest?

Lec. I'd rather you try to integrate the few that you are comfortable with rather than rushing to mass integration and (*unclear*) you can't handle it.

DN Thank you.

- Lec. I'd rather you go with what you are most comfortable with, because you have to do the Practicum and you have to write up the Study. Nobody is going to do it for you. So, take it in stride.
- DN So in that case, the scope of the unit will not be an integrated unit. If you have, let's say, three subjects integrated and single subjects for the rest, then you can't say that the scope of the unit is an integrated unit. You have to put both.
- Lec. You can say partially integrated. And the subjects you have integrated are 'x', 'y', 'z' and the others are done in (*unclear*). And you just give a summary of the themes that arise whether it is from the integration or from the single subject, the basic concepts you are going to teach.
- DN (*writes continuously and intensely during this latter contribution. She continues to write for a short while after the lecturer has ended. As she completes her note taking, she taps her pen a few times on her notepad in an apparent show of satisfaction.*)

Even though Lecturer A appears to be giving students the option to choose between designing a unit based on a single subject and one using an integrated approach, it is evident that she is encouraging them to take the latter route.

Mixed messages

Based on her own account, the lecturer seems for the most part, to be working with a conception of integration that is theme-centred. She explains that the unit will be built around a main theme, concept or topic, from which would be derived sub-themes reflecting relevant subject areas. She cites the strategy of the semantic web (or map) as the reference point against which she is developing the format of the integrated unit. The semantic web is based on the setting up of a core concept or theme with related concepts, themes, topics or even activities being generated in a radiating fashion from the core. What this means is that learning experiences are developed out of concepts, themes etc., not out of subject matter disciplines. The identification of subject areas is not a feature of the design of a web.

What is evident is that the lecturer is trying to encourage students to adopt this theme-centred approach without abandoning the subject matter focus of the school curriculum. However at times in her talk, it is not clear whether it is the theme or the subject that should be the core on which the integrated unit is constructed. At the outset she explains,

You will recall a few weeks ago, when you were looking at the LaSasso article and the strategy used there, semantic webbing. You move from that to see how you could get a variety of themes, a variety of topics. So taking one concept, for example 'cooking', and you can see how you can get the Science out of that...

In this segment, one notes that it is the concept that occupies the dominant position with the subject matter being subsidiary to it. However this relationship between the two is not maintained throughout and at other points there appears to be a shift in perspective. At another point she says,

Say that you are doing an integrated unit, and the subjects you are integrating are Maths, Science...

It is evident that a reversal has taken place and that the subject area has now moved into the position that was once occupied by the theme or concept. As she ends her account, there appears to be a return to the 'web-influenced' model as she concludes

Those can be subthemes that would reflect the variety of subject areas.

There is a certain element of ambivalence in the lecturer's conception of an integrated unit.

Exploiting the ambivalence

From her talk, it is evident that the student holds a conception that gives prominence to the subject matter. For her, integration takes place at the level of the subject. Indeed, in neither of her two interventions does she mention the terms theme, topic or concept, which were key features of the lecturer's account. The tone of her intervention suggests that she is uneasy about the approach that the lecturer is adopting towards the task of designing a unit and she queries it. She is very assertive in her querying and structures both her questions in a manner that allows her to embody the answer that she wants within the question.

In the first instance she sets up a two-part closed comparative question in which the preferred option is not only placed in the dominant last position but is structured as a

statement rather than a true question. Hence she asks,

Do you have to integrate all the subjects or you can integrate a few of the subjects and do single subjects for the rest?

A similar intention of forcing the lecturer to sanction her perspective is apparent in her second input. Here she introduces her query with the phrase, 'So in that case...', conveying the impression that what she is about to propose is a logical follow-up on the lecturer's preceding clarification, and therefore cannot (logically) be refuted.

Based on the responses that she has received it is evident that she has succeeded in getting what she set out to attain, namely sanction for her subject-dominated approach to the design of an integrated unit. In response to the first query about whether to integrate all the subjects or a few, the lecturer agrees that she could integrate a few. Then when confirmation is sought that such a unit 'with three subjects integrated and single subjects for the rest' cannot be described as an integrated unit, the lecturer proposes that it can be described as 'partially integrated'. It can be argued that DN has successfully exploited the lecturer's ambivalence in order to maintain her own conception of what an integrated unit should be.

In a subsequent interview DN reinforces her view of an integrated unit in this way:

OK First of all, what do you understand by the term integrated unit?

DN Having all the subjects linked in some way or the other. So you are planning a unit of work which is all the subjects, into this unit and with that you have *(background noise)* All your subjects should have something that link them to each other. Each subject is not done in isolation so that you should be able to make reference to something in this one that will make the next one a little easier because they had already gotten some previous knowledge or some introduction to the topic or whatever from the lesson before. Then when you have it there again and you link it to another lesson, everything comes together a lot easier than if you do everything specifically different and nothing could link. So, the whole thing about integration is linking the subjects so that it makes for easier recall. It helps them to get the concepts easier and that kind of thing.

In light of the perspectives advanced by both the lecturer and the student, teaching through themes and teaching through subjects represent different and potentially competing conceptions of an integrated unit. This situation is not adequately

highlighted and reconciled in the interaction. Thus there is a blurring of conceptual boundaries which is simultaneously limiting the lecturer's ability to maintain a focus on the theme and providing the student with the leeway to resist conceptual change.

Effecting the change

It is important to note though that this resistance was not detected in all students of Group A. For example, in a subsequent interview, VN showed that her conception of integration was closer to the ideal detected in the lecturer's talk during the session. Nonetheless, there was also evidence of the tension between the subject and theme-centred approaches.

- OK Let's talk a little bit about integrated unit. First of all, were you aware of that concept before you started this programme.
- VN Yes. I was. A lot of other people have done this course before and they have done integrated unit, so I am aware of it.
- OK Did you use it before?
- VN Not as widely as I am doing now. I would do like two subjects. Most likely social studies with reading.
- OK What do you understand by this term "integrated unit"?
- VN It is having a central theme by which you can base all or some of your subject areas around.
- OK Give me an example of that.
- VN If you are doing buying and selling in Social Studies, you can do money for Math. In Science, you can do crops. Selling tends to go into that angle, selling of the produce. Language areas would be nouns, verbs, things related to selling.
- OK So, before, you were teaching Math, History, Social Studies, English and so on and now, as you say, you are trying to link all these subjects under one theme. From your point of view, do you see any ... well, what are the advantages or disadvantages with this new approach?
- VN Advantages would be that the children are focusing along one particular topic and so the vocabulary would be easier in that it is repeated all the time, so they will have a base and they could use (*unclear*) from one area and translate into another. This advantage isn't necessarily to the children, but sometimes it is difficult to do.
- OK For the children?
- VN No, not the children. Sometimes it is difficult to draw the topics under one

umbrella and it tends to limit what you do to a point.

OK Explain that a little bit for me. How do you mean 'limit'?

VN If you are doing 'buying and selling', you have to take an angle now to get buying and selling into your science, so it sort of limits what you do in that you cannot just take a whole wide range (of science). You are just focusing on one middle area.

OK So, it limits what you do in terms of science?

VN No, not only science but in any subject area. It limits your scope.

OK That is interesting to me. You find it limits your scope in terms of the subject area.

VN Because you are focusing on one area.

OK So in terms of the amount of Maths you can bring into it, in terms of the amount of science, in terms of the amount of vocabulary it may (*incomplete*)

VN It depends on the topic. If the topic is wide, you can get a lot of things in it, but if you have a narrow topic, it limits you.

OK You have found that in your teaching?

VN This topic that I am doing is a bit narrow. I am doing crops. I am doing that because I have a theme on Trinidad and Tobago and at this point I am on to crops. So it was difficult to get a wide range from that theme in all the subject areas. So I find that I am not doing all. I am just doing a part in the integrated approach.

OK So, in terms of, if you are building a theory of integrated unit based on your experience, would you say that there is room for single subject teaching as well.

VN Yes. There is room for it. Not all the time you will get something that everything will fit into. You can try and if you keep doing that, eventually there will be things that may be left out in your programme (*unclear*) There may be things that will be left out so you will have to fill in all the gaps.

OK. Who have you shared this information with, what you are just telling me?

VN No one really.

OK Why?

VN No one really asked before.

OK Because I think that is important. Or, let me ask you something. Did this come up because of the way you were introduced to integration on the course?

VN No. It came up because of what I am doing here now.

OK Right. So it came out of your experience. Do you see a point in taking this back into the course?

VN Yes. It could go back into the course. Other people will have different views on it.

OK I am thinking this because all this is building up an idea of integration. Do you remember seeing any of this in your readings, these limitations that you are talking about?

VN. No. They more or less used wide topics like food so that's general. You could use a lot of things for that kind of general topic. So they did not really have that problem. That was not mentioned there.

OK From your point of view, just to wrap up on this part, what is the fundamental theory or the fundamental rationale for teaching or using the integrated approach?

VN Basically, it is to give the children a focus and draw the ideas together so that you find that they can use what they have learnt from one area and use that to help them develop a new area, a different area. Generally, it is supposed to make things easier because you don't have about four or five sets of vocabulary to learn. It is one basic thing. It stems from there.

OK You agree with this?

VN It makes sense.

As noted earlier, VN's conception of the integrated unit is closer to the theme-centred approach observed in the lecturer's talk than that of her fellow student DN. Her definition of the term is precise and clear:

It is having a central theme by which you can base all or some of your subject areas around.

The focus is on the theme, the subject area is subsidiary. Then by way of illustration, she shows how the theme of 'buying and selling' can be handled across subject areas. However it is at this initial stage that the tension begins to emerge. She notes that by taking

an angle now to get buying and selling into your science ... it sort of limits what you do in that you cannot just take a whole wide range (of science).

What is significant is that the student herself recognises this tension, even though she does not appear to accord much importance to it. At the beginning the starting point was the 'umbrella' theme leading to sub-themes (in specific subject areas). Now she is seeing a problem because, from a subject-based perspective, the theme-centred approach limits the scope of the content that can be addressed in a given subject area.

From VN's perspective, this situation highlights the issue of selecting an appropriate central topic since as she herself states, an inappropriate topic, that is, one that is too narrow, 'can limit what you do to a point' or more specifically, 'it limits your scope in the subject area'. As far as VN is concerned, the limiting effect of the topic is defined in terms of the teacher's capability to cover the pre-determined curriculum content of the respective subject areas. For example, the theme 'crops' is considered narrow since it is 'difficult to get a wide range from that theme in all the subject areas.' Thus there is still room for the single-subject approach since it is 'not all the time you will get something that everything will fit into'.

It is evident that VN is still oriented towards a subject-based approach to teaching. In her talk, there is still evidence of the constraining effect of the prevailing subject-based paradigm on the way she conceives of the integrated unit. Nonetheless, of the two participants discussed above, it is she who demonstrates the greater inclination to adopting a theme-centred approach to integration.

Two issues from VN's interview deserve further attention. First, her assessment of the issue of choice of topics points to a gap in the way the whole notion of theme-based teaching is treated in the literature to which she has been exposed. From her point of view the literature has been able to avoid the problem of topic scope by using wide topics like 'food'.

Secondly, up to this stage, she has not felt the need to raise this matter with any one. It is likely that, either she does not see it as very significant, or she regards it as a basic practical problem which she, as a teacher, should be able to handle in the course of her day-to-day practice.

Whatever it is, this issue, which gets to the core of the conceptual conflict underlying a method that students are required to adopt, is not seen to be addressed either in the available literature or in the teaching-learning interaction itself.

Summary discussion

The tendency for the subject area to dominate in spite of clear intentions to project the topic or theme, can be regarded as a reflection of the continued strong influence of the conventional approach to curriculum design and implementation which is itself rooted in a discipline-bound notion of knowledge. What is evident therefore is that an innovation is being imposed on current practice without adequate attention being paid to factors inherent in the one that may not be in harmony with factors in the other. Further, it would appear that, faced with the challenge from the learner the teacher's strategy is to accommodate the learner's conception rather than attempt to engage the learner in an examination of the new in relation to the old. For their part the two learners observed seem, to varying degrees, to have constructed their own version of the new concept in a manner that would not entail excessive cognitive conflict.

Conclusion

This chapter examined data whose focus was the knowledge and skills that have a direct bearing on classroom practice. In this regard, it examined episodes in which lecturer and students were engaged in talk aimed at solving problems and planning for the implementation of new methods. Two issues emerging from the data warrant further attention.

First, the strategy underpinning the approach to problem-solving, namely of applying theory to practice, is largely consistent with the instrumental, means-ends approach about which Schon (1983) has strong objections. This debate was already addressed in the literature review and it is beyond the scope of this research study to pursue the matter any further. Nonetheless I have already noted an inability of students to identify and/or derive the relevant knowledge required to support a specific practical operation. It is worth noting though that the difficulties observed may not necessarily have their origins in the alleged limitations of the the approach mentioned above, but rather in the inadequacy of students' available knowledge base to support the building

of appropriate problem solving skills.

The data also revealed some degree of resistance to conceptual change. Indeed students, feeling unsure about a new form of practice, had developed their own tactics to hold on to their old practices, or to adopt the new in a manner that allowed the old to be retained within the new. At the same time, it appeared that there were no available teaching strategies capable of exploring the resistance.

On the whole, there was little evidence that students were willing to problematise their practice in a manner that facilitated growth. At the same time, it is important to note the one exception to this overall statement, in that one student was seen to demonstrate a capability to examine conflicting modes of operation. However the teaching-learning interaction was not seen as providing the forum for such an examination.

It is also likely that, underpinning all of the above are socio-cultural factors that are eroding the knowledge-building process.

CHAPTER 12

LOOKING BACK TO GO FORWARD

Introduction

This research study was undertaken to achieve two broad aims. First, it would seek to re-examine the concept of interaction as applied in open and distance learning with a view to arriving at one that was appropriate for facilitating study and practice in the field. Then, drawing on the revised concept, it would examine teacher education offerings in the University of the West Indies (UWI) in order to inform that aspect of the institution's proposed distance education programme.

This chapter assesses the research process that was implemented to attain those aims, draws conclusions from the analyses done and makes recommendations for future study and practice. The chapter undertakes these tasks under three headings which respectively represent the three areas of focus of the study - concept-building, research design and implementation, and evaluation of practice.

Concept-building

The first of the two aims of this study was to examine prevailing notions of interaction in order to arrive at a more holistic concept. The formulation of the revised concept in this study is significant for the reasons detailed below.

First it represents a continuation of the theory-building exercise that gained prominence with the work of Holmberg and other theorists of an earlier period (see Keegan, 1990). In light of the conceptual erosion brought about by the recent tendency to focus exclusively on the social aspect of interaction, concept-formulation in this study was geared to re-orient thinking towards a broader, more holistic understanding of the phenomenon. The outcome of this exercise was not simply a restatement and/or reinforcement of the two-part second generation construct, but rather the generation of a rigorously analysed and clearly articulated alternative.

In addition, this enhanced version allows for the recognition of both the multi-faceted nature of the phenomenon of interaction, as well as the functional interrelationship among its constituent parts. In terms of its different facets, the reformulated concept does not only embody the three subsidiary types of interaction (social, learner-media, learner-knowledge), but also acknowledges the effect of other factors, namely power and external knowledge, on how these types function. Indeed the impact of these two factors on learner-knowledge interaction, was very evident in the teaching-learning episodes examined in the observation study, whether the episode was catering for information transmission-reception, problem-solving or any of the five knowledge-building activities identified. Overall, it can be argued that the theoretical construct developed in this study more adequately reflects the complexity of interaction as it is practised in open and distance learning (ODL) than does its predecessors.

With regard to the three separate types of interaction, learner-media interaction was the least developed, both in the context of this study and in the literature reviewed. This situation is not a reflection of the importance of this type in relation to the other two. Indeed, while social and learner-media interaction are both recognised as providing support for learner-knowledge interaction, it is the learner-media aspect that must carry the greater responsibility given the unique characteristics of ODL. Moreover this condition is seen to apply whatever the media used, be it the second generation one-way media or the newer third generation telecommunications and computer-networked technologies.

It is evident, therefore, that greater attention needs to be paid to understanding the factors inherent in this aspect of the overall interaction. While not de-emphasising the significance of the older media, special attention needs to be paid to the issue of learner-media interaction in the context of the newer interactive telecommunications and computer-networked technologies which, however unobtrusively, are shaping the way social interaction takes place in their environments in ways that have not yet been fully explored or understood.

Learner-media interaction was not an area of focus in the research programme of this study. Nonetheless, it is worth investigating if and how participants' interaction with one another could have been influenced by their presence in the audio-conference environment. It is likely, for example, that, being in an all-student location, away from the physical presence of the lecturer, could, at times, have had some effect in 'empowering' the students to challenge the lecturer's knowledge claims. Most of the recent literature reviewed has focused on the interpersonal activity, without specifically exploring how the individual's engagement with the technological milieu could impact on the person-to-person interaction. There is a need to extend the research agenda to include a focus on media-related factors. In addition, it would seem that the capability of these technologies to facilitate synchronous and asynchronous interaction is also an important area of focus in any examination of learners' engagement with the technologies.

A significant feature of the nature of learner-knowledge interaction as developed in the concept-building exercise of this work, is that it does not conform to that aspect of the constructivist way of thinking which recognises a social dimension in the act of learning. This conception of learning was evident in the complementary relationship which some constructivists were seen to establish between collaboration and knowledge construction.

Wilson et al. (1995), in their definition of constructivism, state clearly that learning is collaborative. Gunawardena (1991), in her exposition on collaborative learning, talks about learning as the co-construction of knowledge. Mercer (1995) makes the strong claim that "the essence of human knowledge and understanding is that it is shared" (p.66). For their part, Jonassen and colleagues seek to strike a balance between learning as internal and social negotiation. The position taken in this study is that, notwithstanding the influence that external factors (including factors related to the social context) have on learning, it is at the individual level that learner engagement with cognitive resources takes place. Support for this perspective has been found in that aspect of Kaye's (1992) argument in which he suggests that "learning is inherently an

individual, not a collective process". In focusing on this aspect, I have implicitly opted to exclude the perspective that the writer ultimately advances, namely that, "learning is simultaneously a private and a social phenomenon" (p.4).

At the same time, the extreme self-directed conception proposed by the adherents of Personal Construct Theory was not recommended as an alternative way of viewing learning. However appropriate and relevant Harri-Augstein and Thomas' notion of the inner conversation, there is also need to acknowledge the constraints that external social factors place on the capability of the individual to be completely self-propelling. The impact of external forces on the individual learner's meaning-making, was observed in the main empirical study, both in instances where students seemed to be accepting information presented without questioning, as well as in those instances where students were demonstrating a capability to explore the transmitted information for themselves.

Of special significance, therefore, in my conception of learner-knowledge interaction is the strong awareness of how power relations in the social context manifests itself, not only at the level of interpersonal relationships, but more significantly within the cognitive activity itself. This recognition of the role of power and control in the learning process represents an important departure from the various conceptions of how people learn, advanced in the literature reviewed.

An important feature of the redefined concept taken as a whole, is that it is not medium-specific. The current technology-driven orientation restricts and even distorts perspectives on the study of learning. It is important to develop a conceptual framework for studying interaction in teaching and learning that, as far as possible, transcends the peculiarities of specific environments and conditions. Such a framework could only enhance the power of the study of the phenomenon. The redefined concept can be expected to achieve this objective across a range of distance education operations and in particular those of the less technologically advanced areas of the world.

Finally, it is evident that there is need to assess the validity of this concept through appropriately designed empirical research. In this regard, one notes the

precedent set by Baynton (1992) in her confirmation of Garrison and Baynton's (1987) model of learner control and even more appropriate, that set by Saba and Shearer (1994) in their verification of Moore's (1983) transactional distance.

The exploratory survey and the observation study that comprised this research programme were each developed out of different aspects of the concept, the one from social interaction and the other from learner-knowledge interaction. However, neither of the two sub-studies was intended to validate a theoretical construct. Rather each aspect of the construct provided the conceptual framework for examining real world practice, namely the teacher education programmes of the University of the West Indies..

The research activity being proposed here is intended to focus on the concept itself in a manner similar to that adopted by the researchers just cited. The purpose of such a research project would be to assess the validity of the stated interrelationships among the constituent parts of the concept. Specifically it could seek to articulate what is implied in the notion of 'support' in the proposition that two aspects of the concept support the third. In addition the claim that learner-media interaction subsumes social interaction also needs to be tested.

The expanding distance education programme of the UWI offers an appropriate context for undertaking such a research project, given the fact that systems have only just begun to be put in place for the design and delivery of DE offerings. The fact that these systems are still in a formative state makes it likely that they will be more responsive to innovative experimentation than systems that have long been established.

Further, when viewed in the context of the overall developments taking place in the field, the emerging UWI structure is appropriately positioned to benefit from a research project that seeks to explore and advance understanding of interaction, one of the core theoretical pillars underpinning distance education. As noted earlier, the policy that informed the expansion of the university's DE programme was that its delivery would be based primarily on pre-packaged materials (mainly print, with audio and video components as required) and supported by periodic tutorials. The policy also catered for the inclusion of the already existing audio-conference facility in this tutorial

function.

What is evident is that while the development of DE in UWI has been largely situated in a second generation concept, it already possesses the elements that would allow it to evolve beyond the classic second generation mode and incorporate some features of third generation practice. Indeed it is likely that DE in UWI would of necessity be permanently characterised by this state of 'in-betweenity', functioning in a 'technologically-mixed' environment that combines conceptions of DE as separation between teacher and learner with conceptions that favour optimum interpersonal contact notwithstanding physical separation. Such an environment can be expected to present the institution with a rich opportunity to explore and deepen understanding of interaction as a multi-faceted construct as defined in this work.

Research design and implementation

The three-part conceptual model discussed above provided the theoretical framework for pursuing the subsidiary aim of this work, namely to examine interaction as it is practised in the current teacher education offerings of the Faculty of Education with a view to informing the proposed expansion of the Faculty's programmes through distance teaching. In this regard, a research programme was developed comprising two sub-studies, namely an exploratory survey, based on principles inherent in social interaction, and an observation study that was informed by learner-knowledge interaction.

The most significant feature of the observation study was the design and use of the interpretive framework which served as a core organising structure for the entire data analysis, starting from the categorisation of units of analysis to the generation of subsidiary questions and the actual detailed analysis of the data based on these questions. The five knowledge-building categories which constituted the primary component of the framework and the five control management categories which represented the associated set, were always in view throughout the entire data analysis exercise. The framework therefore performed an important function of giving focus and

cohesion to the observation study.

Another important attribute of the framework was that it was built on two rather than one set of categories with the intention that both would be manipulated jointly when applied to the data. The fact that a single unit of analysis could be defined simultaneously as both a knowledge-building activity and a control management function, made for a more integrated and richer interpretation of the data.

This framework was designed to facilitate data analysis in the observation study. Unlike Henri's Framework for Content Analysis, the one in my study was not tested for implementation by practitioners in the field. This however does not preclude against continued research work to investigate its suitability for analysing interaction in other teaching-learning contexts and in the process to refine it.

With regard to the data collected, both the video-recorded observations and the audio-recorded interviews provided data that offered substantial scope for analysis within the context of the research questions. Notwithstanding the periodic technical difficulties in the operation of the audio-conference system and the irregular attendance of the Group A participants, I was able to collect sufficient data of the on-line sessions. What was particularly worthwhile was the capability of video to capture incidents of off-line chat and non-verbal communication of the students. These 'unofficial' communicative events proved to be very meaningful in the context of the overall discourse.

It may be argued that since the video data were dominated by teacher talk, it could not really be described as teaching-learning interaction. There are two responses to that observation. First, while the official talk of the students was considerably less than that of the teachers, there was, as noted above, sufficient off-line verbal and non-verbal communication on the part of the students which contained messages that revealed a student input into the interaction. In any event, the interviews provided a useful avenue for exploring student responses, given instances of limited on-line talk during the sessions.

Secondly, it is important to note that the interpersonal interaction between teachers and learners was not itself the focus of the observation study. Rather the interpersonal interaction was the vehicle that contained the talk of both teachers and learners which was analysed to investigate what it (the talk) revealed about learner-knowledge interaction. The talk of both teacher and student was considered important in this regard since both types were seen as feeding into and/or revealing the knowledge-building activities of the learner. In light of the above, I am satisfied that the video data were adequate, given the requirements of the observation study.

On the whole, the interviews were able to elicit useful data from the participants, partly because of the appropriateness of the pre-planned questions, but also because of the probes and prompts that I was able to interject at critical points. One interview which benefited from this latter feature was the one in which MK was wrestling with herself aloud, trying to come up with a perspective that would honestly reflect her thinking on pupils' assessing themselves. Interestingly enough, MK was the only interviewee who responded in this way to the relevant question, thus the direction which the interview took was completely unexpected, and probing and prompting had to be employed to a great extent.

However there was one set of responses which, on reflection, did not appear to be adequate and which was therefore excluded from the analysis. These data were collected in a conscious attempt to get students to verbalise their thought processes and reveal how they would prepare to respond to discussion questions which the lecturers had put to the respective groups. My intention was to get access to the students' 'inner conversations' (Harri-Augstein and Thomas, 1991). What I learnt from this largely unsuccessful exercise was that I needed to be more aware of both the capabilities and the limitations of the data collection tool that I was using. In hindsight, it was not feasible to expect an open-ended interview format that included a variety of item-types, to be able to handle such a focused and demanding task. In addition the students did not give the impression that they were willing to allow themselves to be subjected to such difficult 'work'. On further reflection, it is likely that this exercise could have been

more successful if conducted with pairs or small groups of participants.

Such an approach to interviewing would also have required greater focus on the individual student as the focus of the study. In the study as planned and implemented, while I was drawing data from the students, the focus of study was not the students *per se*, but rather critical incidents as revealed in episodes extracted from the video-recorded data and supported by related data emerging from the interviews. Interestingly though, the likelihood of a person-focused orientation to the study became evident from time to time as I detected attributes that seemed to offer the possibility for more detailed and in-depth study. For example, there were some important differences between DN and VN of Group A, both in their conception of themselves as teachers as well as in their approach to dealing with the new knowledge about the design of an integrated unit. Situations such as this one seemed to offer scope for examining the relationship between learner characteristics and approach to knowledge building.

However such an extension could not be entertained in the current research programme partly because the observation study itself was not designed to accommodate that level of detail and partly because of the ongoing uncertainty about the attendance of some of the students. Clearly there would have been need for a higher level of commitment to the research process by the participants, which was not always the case.

The relationship between the survey and the observation study was also an area of interest. The integrated way in which it was envisaged that these two methods be used, did not occur in this instance. Nonetheless their shared origin in the revised concept of interaction, (the survey based on social interaction and the observation study on learner-knowledge interaction), allowed for useful connections to be made between the findings of both studies. For example in the observation study, one student remarked during an interview that she would have preferred to respond to the question posed in a group with two of her colleagues. The point was made earlier that her remark seemed consistent with the findings emerging from the survey data that appeared to favour the setting of the individual with two or three other students for discussing

issues arising out of the readings.

Possible linkages were also evident at a more global level. For example, one survey finding appeared to point to a tension in students' definition of themselves as learners. At one level the students of the survey were projecting themselves as being capable of independent learning, and at another, they were contradicting this stance and making demands of the teaching system in a manner that seemed to suggest that they were casting themselves in a subordinate position.

In a parallel situation in the observation study, at times students could be observed challenging the knowledge claims of the lecturers and, in the process, gaining control of the discourse. However having gained the upperhand, they would be unable to maintain that position, and would ultimately find themselves in a subordinate position, operating under the control of the teacher.

Overall what both sets of findings seem to be pointing to is the need to ensure that the social setting provides adequate support for learner-knowledge interaction.

Finally, there is the issue of the generalisability of the findings of the respective studies. In developing his argument in favour of qualitative methodologies, Firestone (1993) identifies three ways of addressing the question of generalisability. These are extrapolation from sample to population (for quantitative research), analytic generalisation, using a theory, and finally, case-to-case translation (for qualitative research). Goetz and LeCompte's (1984) notion of interobserver reliability closely parallels Firestone's description of case-to-case translation (or transfer).

As already mentioned, the survey, though an example of quantitative research, does not really qualify for sample -to-population generalisation, given the factors identified earlier, namely, smallness of sample size and the absence of pilot testing. On the other hand, with regard to the observation study, I am satisfied that it meets the requirements for case-to-case transfer. I have provided clear accounts of the rationale and conduct of the study to allow readers to determine whether its findings are applicable in other settings.

Based on all of the foregoing, I would conclude that,

1. the interviews benefited from the impromptu strategies employed during the exercise.
2. the quality of the data analysis of the observation study was substantially enhanced with the use of the interpretive framework.
3. the fact that the two sub-studies represented different aspects of the same conceptual framework allowed for useful inferences to be drawn by examining aspects of each sub-study in relation to the other.

Finally, four possible follow-up studies deserve consideration. The first involves continued research work to test and refine the interpretive framework. The second also emerged out of the observation study and is intended to allow for a clearer focus on the individual learner. It is envisaged that a study can be designed to examine how learner characteristics influence and are influenced by the way individual learners interact with knowledge.

The idea for the third was devised out of possible complementary findings emerging from both sub-studies. It is suggested that a further study can be designed to investigate whether the manner in which students seek to register their disagreement with the teacher's knowledge claims can provide cues to illuminate the inconsistent findings suggested by the survey regarding students' perceptions of themselves as independent learners. The fourth follow-up study, already discussed in the preceding section, would seek to assess the validity of the three-part concept of interaction, that was formulated in this work.

Evaluation of practice

Ultimately the intention of the research programme discussed above was to inform future practice in the Faculty of Education as it embarks on its expansion of its DE offerings. In this regard, the contribution of the interpretive framework of the observation study cannot be underestimated. The two-part category system on which the framework was built contributed significantly to illuminating the talk and other

communicative events in the teaching-learning interaction, thus allowing for useful analysis of learner-knowledge interaction as revealed through the discourse. As noted earlier, there were two sets of categories. Knowledge-building activity was the label ascribed to the primary set and control management function the label for the associated set.

Five knowledge-building categories were identified, namely,

1. Setting the objective of the interaction.
2. Information transmission-reception.
3. Planning for the implementation of new methods.
4. Problem-solving.
5. Higher order examination of course content.

Each of these categories was further divided into sub-categories.

The control management categories were,

1. Establishing control.
2. Maintaining control
3. Gaining control.
4. Operating under control.
5. Breakdown of control.

These categories, when applied to the data, allowed for the following conclusions to be drawn about the practice observed. First, it would appear that there was not a sufficiently clear enough articulation and acknowledgement of different sources of knowledge that fed into and impacted on the student-teacher's knowledge building activities. Specifically there was evidence of tension between the official content as transmitted by at least one of the lecturers and the practical experiential knowledge of the student, with neither being able to find ways of openly acknowledging differences of conception and working through those differences in a reasonably transparent manner. This tension was particularly evident when the lecturer was attempting to introduce information aimed at directly changing classroom practice. In many of the instances where students could be observed gaining control of the

interaction, it was in the context of their resisting the lecturer's knowledge claims about approaches to practice and devising tactics to ensure that theirs was not undermined.

Those students observed engaging in this kind of act did not appear to have the confidence to open up what they would have held to be true, for critical assessment. Their approach seemed to be characterised by an intention to defend and preserve rather than to problematise and build.

While not condoning this approach to learning, the situation probably arose because teaching was not geared to allow for adequate articulation and examination of the practitioner's knowledge. It seems therefore that what is required is an appraisal of the epistemological paradigms governing teacher education with a view to allowing optimum openness and objectivity in the treatment of all forms of knowledge.

While in certain situations there was clear evidence of students' not wanting to let go of their long-held beliefs and/or practices, in other situations the pattern was one of some students' accepting the knowledge claims of the teacher without any overt attempt to question them. It must be noted, though, that this situation did not apply across the board. On the contrary, there were examples of students, in particular during the interview stage, raising critical questions about teacher-transmitted information.

However even in the case of the latter type of student, their ability to evaluate would eventually be suppressed by a perceived need to re-adjust their thinking to bring it in line with the official perspective. The dominant authoritative 'voice' of the teacher seemed to be all-pervasive.

It can be argued that the primary factor contributing to this situation was the construction of the teaching discourse, in particular for the presentation of information. Teacher-discourse tended to be assertive and prescriptive, allowing little room for reflection or analysis on the part of the recipient. The effect of this approach to language use brings into focus Potter and Wetherell's perspective on discourse analysis, and in particular the writers' conception of the three interrelated components within the discourse. Of special interest is their proposition that function, one of the components, entails the unintended consequences that emerge from language use even when the

discourse was not specifically formulated for that purpose.

When viewed in this light, the discourse of the teacher not only served to reinforce the already asymmetrical teacher-learner relationship, but, more importantly, it limited the potential for meaning-making on the part of the learner. Given that type of teacher talk, some students seemed to abandon their right to derive personal meaning from the information to which they were being introduced, while others who felt the necessity to make the new information meaningful, found themselves thwarted in the process, and giving in, at least partially, to the unquestioning acceptance that even they seemed to think was required of them. What this situation suggests is that any attempt to facilitate more meaningful engagement in the act of learning, must also address the issue of the language of teaching.

It must be noted though that the lecture-presentation was not the only teaching-learning strategy used. There were occasions when sessions were based on some form of question-answer exchange. More often than not it would be the guided discovery method that was being used either for problem-solving or as a means of encouraging critical engagement with readings. As noted earlier, students of one of the groups observed, welcomed this alternative teaching strategy.

In the sessions observed, the question-answer strategies employed did not seem to be robust enough to facilitate the attainment of the desired goals, whether in relation to problem-solving, or for analysis of the reading materials. Consequently, to the extent that the teaching system sees itself as having a responsibility to facilitate the building of problem-solving and critical thinking skills in its student-teachers, there is need for it to pay greater attention to developing systematic strategies that have the highest probability of allowing for the development of these skills. In this regard, three areas stand out.

First, given a situation where conceptual change is recognised as a critical aspect of the student-teacher's professional training, the teaching system would need to devise and use strategies that allow for optimum airing and problematising of prior conceptions. In the instances observed, these proved to be a major obstacle to student-teachers' making the transition to new modes of thinking and, by extension, new

modes of practice.

Secondly, greater attention needs to be paid to identifying and articulating hidden layers of knowledge that underpin the overt course content and which students need to be able to manipulate if they are to demonstrate the higher level competencies that the teaching system demands of them. One recalls the exercise when students in one of the groups were asked to generate an appropriate strategy for teaching a story, and it soon became evident that their knowledge of the strategies they were identifying by name was restricted. It is likely that this type of knowledge may not be in the standard study texts that are available, hence the need for it to be generated within the teaching-learning interaction itself.

Thirdly, learners are likely to benefit from the use of strategies that combine synchronous and asynchronous teaching-learning interaction in a purposeful way. For example, if students must analyse reading material, what are the component activities subsumed within that complex task, and how can these activities be divided between real-time, face-to-face interactive sessions and other learning situations that require delayed feedback, in a manner that facilitates optimum learning?

Encompassing all of the above is the question of the knowledge base of teacher education. What is evident is that an integral aspect of any teacher education programme must be the continuous appraisal of the knowledge that provides the foundation for the profession. For example, to what extent is the current conception of the school curriculum based on notions of knowledge as divided into separate subject areas and to what extent is it based on knowledge as an interdisciplinary phenomenon. As noted in the analysis of the data, the tension inherent in such unresolved issues can influence how learners engage in the act of knowledge building.

All of the above become even more pertinent as the Faculty of Education sets about to expand its distance education programme. This study was conducted in a programme currently offered through audio-conferencing which caters for a very limited number of participants throughout the Caribbean region. The proposed development, would, however, involve a shift with the primary mode of delivery being

pre-packaged materials, supported by a limited number of tutorials, both face-to-face and by audio-conference. A larger student body would therefore be required to work largely independently of the institution and to attain the standards of professionalism that the various regional agencies are now demanding as they seek out educational and training opportunities for their professionals. In addition, given the extent of the demands made by these agencies, the Faculty will be required to maintain standards over a relatively wide range of programmes, intended for different target groups within the education system. The Faculty of Education would therefore need to address the issues discussed above as it embarks on the formal exercise of conceptualising and designing teaching-learning experiences for its distance-taught student-teachers.

Conclusion

The expectations that are held out for teacher education provision by the University of the West Indies, make it critical that the university ground its development of distance education in clearly thought out theoretical understandings and that it develops appropriate strategies for operationalising these. It is in this context that this revised concept of interaction for open and distance learning is being proposed.

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APPENDIX 1



The Open University
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Institute of Educational Technology

August 15, 1994.

Dear Colleague,

Survey of adult learners' views on their learning.

I am a post-graduate student at the Open University (OU) in the UK, working towards my Ph.D in the field of distance education and I am seeking your assistance in this survey.

My area of research is self-directed learning in a distance learning context and I am seeking to get as broad an understanding as possible about how adult learners view their own learning. In this regard, I would like you to complete the attached questionnaire, please.

Although you are not now studying at a distance, the data that you provide can help me build profiles of potential distance learners and also inform my perspectives on the design of course materials and the structuring of relevant aspects of the distance learning environment itself.

As you are no doubt aware, the University of the West Indies has embarked on a programme to develop its distance education capabilities and I see my own research as being relevant to that development. Actually I am at the OU on study leave from my position as lecturer in educational technology in this Faculty.

Obviously I do not expect you to approach this questionnaire as if you were sitting an exam! However I do hope that you will treat the exercise with some seriousness and that your responses will reflect your perceptions as closely as possible.

As a follow-up, I will like to talk with some of you on issues arising from your responses. I am therefore asking you to write your name clearly on the 'Interview Request' slip attached at the end and return it separately from the questionnaire. Of course you are not obliged to supply your name. If you choose not to, please detach and hand in the blank slip all the same. If you are taking the questionnaire away however, I would need to keep a record and therefore I would need to retain the slip with your name on it. In such a case it will be a record slip and will not automatically mean that you have volunteered to be an interviewee. If you so desire, the slip can be destroyed when you hand in the completed questionnaire.

I wish to assure you that the information you provide will be treated with the utmost confidence and that the data will not be used in any way that compromises confidentiality.

I greatly appreciate the time that you are taking from your own responsibilities to participate in this exercise and I wish to thank you for that at the outset. Thank you sincerely.

Your colleague in education

Olabisi Kuboni (Ms.).



Adult Learners' Views About Their Learning

Card ① (1)

OK94 (2-5)

Please put a circle around the code like this ④, or write your answer in the space provided

Section A - Talking with lecturers

You and your lecturers are always communicating with one another. Below is a list of some types of oral communication that you probably engage in with them from time to time. Based on your own experience indicate how frequently you think you are involved in each of these types of communication.

(Circle one answer only for each line)

	Very often	Often	Sometimes	Rarely	Never	
a) You ask lecturers to clarify a point.	5	4	3	2	1	(6)
b) You answer questions that lecturers ask.	5	4	3	2	1	(7)
c) You express ideas which lecturers appear to value as much as theirs.	5	4	3	2	1	(8)
d) You ask lecturers to explain curriculum goals.	5	4	3	2	1	(9)
e) With other students you recommend changes to the overall programme of study.	5	4	3	2	1	(10)
f) You listen to formal presentations from lecturers	5	4	3	2	1	(11)
g) You set the topic for a group discussion with students and a lecturer.	5	4	3	2	1	(12)
h) You support a point made by a lecturer on some aspect of the course content.	5	4	3	2	1	(13)

	Very often	Often	Sometimes	Rarely	Never	
i) You engage in a brain storming session where lecturers and students function at the same level.	5	4	3	2	1	(14)
j) You make adverse comments about the curriculum that lecturers appear to accept.	5	4	3	2	1	(15)
k) In a group setting you openly disagree with the views of the lecturer on some aspect of the course.	5	4	3	2	1	(16)
l) You have the final say in a group discussion with students and a lecturer.	5	4	3	2	1	(17)
m) You argue with a lecturer on a one-to-one basis.	5	4	3	2	1	(18)
n) You re-focus a discussion, involving students and a lecturer, which you feel is drifting.	5	4	3	2	1	(19)

Section B - Which settings are most useful for which learning tasks?

Outside of the large group lecture/discussion sessions, there are other settings in which you carry out various tasks. Five settings have been identified and these are coded 1 to 5 below. A series of tasks has also been listed.

For each task, circle the code for:

- a) the setting which you consider most useful for carrying out that task.

AND

- b) the setting which you consider least useful for carrying out that task.

If you feel that none of the settings is useful for a particular task go straight to the 'none' column and circle 6 for that task. Please base your responses on your actual experience.

The settings, with their codes are:

1. individual studying alone
2. individual with one or two other students
3. individual on one-to-one basis with lecturer
4. small group session (15 or less) - students only
5. small group session (15 or less) - students with lecturer

Example

TASKS	CHOICE OF SETTINGS		
	Most Useful	Least Useful	None
a) reviewing your notes.	① 2 3 4 5	1 2 3 ④ 5	6
b) having a debate.	1 2 3 4 ⑤	① 2 3 4 5	6
c) borrowing a book.	1 2 3 4 5	1 2 3 4 5	⑥

TASKS	CHOICE OF SETTINGS			
	Most Useful		Least Useful	None
a) clarifying what the course objectives are.	1 2 3 4 5 (20)	1 2 3 4 5 (40)	6 (60)	
b) identifying central topics or themes of the course content.	1 2 3 4 5 (21)	1 2 3 4 5 (41)	6 (61)	
c) seeking explanations for aspects of the content you are unclear about.	1 2 3 4 5 (22)	1 2 3 4 5 (42)	6 (62)	
d) making links between theory and real world experiences.	1 2 3 4 5 (23)	1 2 3 4 5 (43)	6 (63)	
e) relating your previous knowledge with knowledge you are now acquiring.	1 2 3 4 5 (24)	1 2 3 4 5 (44)	6 (64)	
f) seeking clarification for something you did not understand in your readings.	1 2 3 4 5 (25)	1 2 3 4 5 (45)	6 (65)	
g) deriving satisfaction from learning.	1 2 3 4 5 (26)	1 2 3 4 5 (46)	6 (66)	
h) finding reassurance when faced with personal problems.	1 2 3 4 5 (27)	1 2 3 4 5 (47)	6 (67)	
i) drawing up plans for a project you are doing on your own.	1 2 3 4 5 (28)	1 2 3 4 5 (48)	6 (68)	
j) clarifying what you have to do for course assignments.	1 2 3 4 5 (29)	1 2 3 4 5 (49)	6 (69)	
k) ensuring that you are clear about the criteria for assessing assignments.	1 2 3 4 5 (30)	1 2 3 4 5 (50)	6 (70)	
l) identifying relevant sources of data for doing assignments.	1 2 3 4 5 (31)	1 2 3 4 5 (51)	6 (71)	
m) deciding how best to use data collected for doing assignments.	1 2 3 4 5 (32)	1 2 3 4 5 (52)	6 (72)	
n) dealing with difficulties that come up while doing assignments.	1 2 3 4 5 (33)	1 2 3 4 5 (53)	6 (73)	
o) discussing issues arising from your readings.	1 2 3 4 5 (34)	1 2 3 4 5 (54)	6 (74)	
p) gaining self-confidence as a result of the learning experience.	1 2 3 4 5 (35)	1 2 3 4 5 (55)	6 (75)	
q) dealing with difficulties that you encounter while doing your own project.	1 2 3 4 5 (36)	1 2 3 4 5 (56)	6 (76)	

	Most Useful		Least Useful		None
r) building interpersonal relationships out of shared learning interests.	1 2 3 4 5 (37)		1 2 3 4 5 (57)		6 (77)
s) negotiating roles for doing a class project.	1 2 3 4 5 (38)		1 2 3 4 5 (58)		6 (78)
t) working through problems that come up while doing a class project.	1 2 3 4 5 (39)		1 2 3 4 5 (59)		6 (79)

Section D - Taking responsibility for your learning.

How much responsibility do you think you are able to take for your learning? Listed below are some responsibilities which may or may not form part of your learning experience to date. Based on your knowledge of yourself as a learner, indicate the extent to which you feel yourself capable of handling these responsibilities for any single course of an entire programme of study.

(Circle one answer only for each line)

	Capable	Fairly Capable	Only Just Capable	Not Capable	Definitely not Capable	
a) Given a topic and broad course outline, set your own objectives.	5	4	3	2	1	(19)
b) With topic and outline, work out the objectives on a one-to-one basis with a lecturer.	5	4	3	2	1	(20)
c) Choose from among pre-set objectives.	5	4	3	2	1	(21)
d) With the support of a lecturer, draw up a study programme (or long-term project activity)	5	4	3	2	1	(22)
e) On your own, break down the agreed study programme (project activity) into smaller units of work.	5	4	3	2	1	(23)
f) Decide how you want to be assessed.	5	4	3	2	1	(24)
g) Negotiate methods of assessment on a one-to-one basis with a lecturer.	5	4	3	2	1	(25)
h) Assume full responsibility for scheduling your study time.	5	4	3	2	1	(26)

	Capable	Fairly Capable	Only Just Capable	Not Capable	Definitely not Capable	
i) Set your own deadlines.	5	4	3	2	1	(27)
j) Work on your own most of the time and participate in fortnightly group sessions that include the lecturer.	5	4	3	2	1	(28)
k) Work out deadlines with the lecturer.	5	4	3	2	1	(29)
l) relate to the lecturer as a support for your learning rather than as the person who directs it.	5	4	3	2	1	(30)

Please answer the following questions:

- a) Based on your present experience of learning, list 3 personal strengths which you feel you rely on to manage your learning. (31-37)
- b) Based on your present experience of learning, list 3 personal limitations which you feel hamper you in the management of your learning. (38-44)
- c) List 3 factors outside of yourself which you feel facilitate you in the management of your learning. (45-52)
- d) List 3 factors outside of yourself which you feel hinder your ability to manage your learning as you would like to. (53-60)

APPENDIX 2

REVISED CLASSIFICATION OF TEACHER-LEARNER KNOWLEDGE-BUILDING DISCOURSE.

Section 1: List of Categories

CATEGORY CODE	CATEGORY DESCRIPTION
T-A	Teacher states goal of area of study
T-B	Teacher transmits pre-determined information to learner
T-C	Teacher highlights core topic(s), concept(s), principle(s), theme(s) to support learner focus within a complex environment.
T-D	Teacher presents stimulus to solicit specific information from learner.
T-E	Teacher sets up framework to support learner in generating information from own knowledge base or in clarifying, examining, elaborating the knowledge base.
T-F	Teacher confirms, corrects, queries, extends on learner response to initial teacher stimulus.
T-G	Teacher probes learner, using open-ended questions to extend on input made.
T-H	Teacher summarises own presentation or inputs from learner with broad generalisation.
T-I	Teacher repeats, clarifies, adjusts, elaborates on previously presented information in the light of learner request/ query.
T-J	Teacher supports, manages learner movement between inductive and deductive reasoning.
L-A	Learner states or implies own expectations of area of study.
L-B	Learner seeks clarification of information transmitted.
L-C	Learner recalls, analyses experience in the light of topic, theme of study or uses experience as vehicle for manipulating some aspect of theoretical knowledge.
L-D	Learner provides specific response to specific question from teacher.
L-E	Learner generates information from knowledge base or clarifies, examines, elaborates on the knowledge base within the boundaries of the supporting framework set up by the teacher.
L-F	Learner questions teacher to ascertain accuracy/efficiency of information received from teacher.
L-G	Learner questions teacher in order to evaluate own knowledge base.
L-H	Learner proposes alternative viewpoint to that advanced by teacher.

Section II: Classification of discourse from seminar on the role of empirical research in IT-related theses.

T-A: Teacher states goal of area of study

What I'm hoping we will accomplish today is to set out for ourselves a description of the space of empirical study.

T-B: Teacher transmits pre-determined information to learner

There is a sense in which people take the model of science, that there are theories and from theories we derive hypotheses and create small controlled experiments to test these hypotheses... This experiment will give us information that says either that the hypothesis is correct or that it is not. (This) hypothetico-deductive methodology is certainly a valid methodology but in the context of research in this field is (pause) primitive. There are broader techniques. I would suggest to start with that there is a continuum of errr 'quantitativeness' and 'qualitativeness'...

T-C: Teacher highlights core topic(s), concept(s), principle(s), theme(s) to support learner focus within a complex knowledge environment.

Think hard about a space (of empirical study) that considers things like:

What kinds of questions might one try to answer empirically?

What kinds of study might one design and what kind of data can one get from that study?

What kind of research outcomes can one expect?

Those are three possible dimensions for this space.

T-D: Teacher presents stimulus to solicit specific information from learner.

What's the difference between quantitative and qualitative?

What does empirical mean?

OK, formative, summative, - ideas?

How many people think that empirical study means experimentation?

So what kinds of questions do you want to go into the world and ask?

What kind of outcomes might one hope for?

T-E: Teacher sets up framework to support learner in generating information from own knowledge base or in clarifying, examining, elaborating the knowledge base.

Choose a point at random (along a line drawn to represent the continuum from quantitative to qualitative). Alright in the middle. I want to do an experiment in the workplace and what I want to do is specify the tool, task rules. I'm giving people a structured task but they would be in their own environment and I am going to sit down and observe them do it. I'm going to take a full video recording which I am going to transcribe. What is good about that? What do I get? (Task to list advantages and disadvantages of different types of empirical studies).

Do you anticipate that the system you design will be based on studies that you do or on what you think is the right thing for visualisation?

By real world do you mean in the normal way or in laboratories?

T-F: Teacher confirms, corrects, queries, extends on learner response to initial teacher stimulus.

*(Learner states advantage of type of empirical study described above).
That's right. I'll be able to see environmental factors and I might be able to see them where they (participants) are more comfortable.*

T-G: Teacher probes learner, using open-ended questions, to get learner to extend on input made.

*(Learner identifies 'hard data' as an advantage of experimental study)..
Hard data, what does that mean?*

*(Learner states difference between formative and summative evaluation).
And why is this important?*

*(Learner asks about the possibility of combining formative and summative evaluation, and quantitative and qualitative methodologies).
Is there any context in which you will be satisfied with any single point in this space of empirical study?*

T-H: Teacher summarises own presentation or inputs from learners with broad generalisation:

The position from which I work, if I could summarise, is that none of these is a panacea, none is an ideal.

Now the reason I'm trying to get you to do this is... the way you design an empirical study depends on the kind of question you ask.

So when you start an empirical study, what are the questions. It's very simple.

And so, part of asking the research question is asking what is the research outcome.....not what is the question, but what do I want to get out of the answer.

The point is...you got a keyhole on the world, you got a very small keyhole. And where are you going to aim your keyhole. And the answer is, some things will fall in it, some things will not.

T-I: Teacher repeats, clarifies, adjusts, elaborates, emphasizes previously presented information in the light of learner request/query.

(Learner asks about the dangers of formulating leading questions). I'll give you a story on that one. (Teacher uses example of Colgate market research to illustrate problems that can arise from bias in research question).

The fact is that the nature of the question biased the outcome. This does not only happen in terms of surveys... but it also happens in terms of experimental tasks. Is the way that you set up the experiment going to bias the outcome of the experiment?...If I pose the question in this way, what bias will it introduce. Not does it introduce a bias, but which bias because it's almost guaranteed that it will.

(Learner wonders whether study being described by teacher should not also include questions on the 'effect of the treatment').

Well, should we go into those things? If you are asking a research question, you got to ask yourself, do I want to know that information? Is that important? Do I care what the affect is, what affect does it have toward something I want to experience? It may be that's the subject of the research. It may be you just dont care because it's not what you're looking at. The point is where are you.. You got a keyhole on the world.....

T-J: Teacher supports, manages learner movement between inductive and deductive thinking.

So when you start an empirical study, what are the questions...And so you have to ask questions like:

What do I want to know? I have a system...that visualises genetic algorithms. What do I want to know about it? Is it pretty? Is it appealing? Can you learn it in an hour? If you learn it does it change your performance on some task I give you? Is it deemed to accurately represent the algorithms that it is meant to represent?

These are all questions. And they are all different questions...How you ask questions is absolutely very crucial.

(As a continuation of general question about types of questions a researcher would formulate, teacher directs attention to particular learner and asks:)

What did your surveys ask?

*(Learner replies children's views on religion and television)
So, beliefs and opinions.*

L-A: Learner states or implies own expectations of area of study

(No specific extract could be identified for this category; however, I think that, implicit in some of the learner inputs was the probability that teacher-stated goal was not always consistent with learner aims.)

L-B: Learner seeks clarification of information transmitted.

I want to ask a very silly question. I want to ask for a definition of empirical.

L-C: Learner recalls, analyses experience in the light of topic, theme of study; learner uses experience as a vehicle for manipulating some aspect of theoretical knowledge.

(At intervals, during learners' brief presentations, outlining their research work, teacher inserts the question, 'Have you done any empirical work before?')

My interest is using software for teaching reading in primary schools...I've done what I would call a pre-pilot study. A piece of software I've looked at is using a talking word processor. I've taken one child through that scheme.

My work is going to be a quasi-experiment.

I am looking into the visualisation of some AI techniques...I am hoping to do some empirical evaluation of any systems I develop. I've already done some empirical work evaluating user interface interaction.

What I am planning to do...is take a small group and test some of my ideas out and use that to develop some criteria for a larger tool and develop that for my empirical study.

I've done a couple of errr experiments, I hate that word, empirical studies, I think, and I am hoping there will be some empirical side to (my current) work.

(As an example of an evaluation-type question, learner suggests, 'Is it beneficial?'. Teacher asks further, 'What's beneficial?').

Well...in the context of what I am interested in... is it going to enable learning to take place, so from the reading point of view, is their reading level going to be improved, is that improvement going to be sustained over a period of time.

L-D: Learner provides specific response to specific question from teacher.

(Responses to questions listed under Category T-D).

Quantitative research is measurable, it is experimental as you say, by definition the word 'quantitative' is, as far as you can quantify something.

*It must be intended for people, it must be people-based.
It has to be some way observational.*

Formative is, you are building up as you go along, summative is the final outcome.

Does the world meet this theory.

If the hypothesis has been proven.

Learner generates information from knowledge base or clarifies, examines, elaborates on the knowledge base within the boundaries of the supporting framework set by teacher.

(Advantage of empirical study outlined in Category T-E):

That you haven't taken them out of their environment, in which case they are in a familiar setting.

(Responses to last two situations in Category T-E).

I think it is going to be based on what I think is right for visualisation.

That's where I have a great...question mark because... in two studies I've done...with one group...I've actually taken a group of students who were about to sit an exam, they did a diagnostic test under exam conditions. ...The second group (were) students at a study centre who had to come anyway for a lecture...so I did not take them out of their environment.

L-F: Learner seeks to ascertain accuracy/efficiency of information received from teacher.

So you're saying you've got to do a little of both? (quantitative and qualitative).

So can I just ask, is it right to say that for each study that you got to do, it has to be at a specific point on the continuum. Is it too much to try to get some quantitative and qualitative even for one trial?

L-G: Learner questions teacher in order to evaluate own knowledge base

Where would you put Action Research? I would put it about there (pointing to position beyond qualitative end of line representing continuum).

Is there something like, if you have a summative project you ought to have a formative stage beforehand and if you have a qualitative maybe you should have a quantitative...How common is this view?

I was just wondering, if one couldn't, perhaps it's not a good idea to categorise people so absolutely, but you yourself mentioned physics. Would you say, if you were to apply the spectrum throughout different disciplines that you could put physicists on one end and philosophers on the other?

L-H: Learner proposes alternative viewpoint to that advanced by teacher.

But these are leading questions, aren't they? The way you ask questions, you expect a certain reply. Because you ask them that way, you actually get that answer.

Shouldn't we be looking at the effect of the treatment, for want of a better phrase or word, on the people that we are working with? because we are looking at them only as objects. But surely, we should be trying to get their opinions, their beliefs, if they enjoy something...

But it may be that there is a continuum here (formative/summative distinction) as well, because one of the things I'm looking at is assessing something and using the data I get from that to redefine the criteria...So again it's something that is assessing up to a point but then it's suggesting things for the next generation.

Olabisi Kuboni
February 16, 1995

APPENDIX 3

email:o.i.kuboni@open.ac.uk

18 October 1994

[The acting head]
Department of Educational Studies
University of the West Indies
Mona
Kingston 7
Jamaica.

Dear

Thanks for your fax of October 7, 1994 and all the information which it contained. As advised in your note. I will be communicating with [the head] when he returns to office. I have decided to work with students in [Group A] so I will be contacting the relevant specialist lecturer as well as the local tutor

Thanks again for your help and I am sure we will be meeting each other again in the near future.

Best wishes.

Sincerely

Olabisi Kuboni

email: o.i.kuboni@open.ac.uk

18 October 1994

Dr.
 Department of Educational Studies
 Faculty of Education
 University of the West Indies
 Mona
 Kingston 7
 Jamaica, W.I.

Dear.....

This letter comes as a follow-up to correspondence between myself and [the] acting head of the Department of Educational Studies and I am writing to you in your capacity [within] the UWIDITE Certificate of Education programme.

In my substantive post I am the lecturer in educational technology in the Faculty of Education, St. Augustine. Currently I am at the Open University working towards my Ph.D. in Distance Education. My area of interest is interaction and learner behaviour in a distance education environment (see overview attached). In this regard I have already sought and received initial permission from [the acting head] to conduct research among UWIDITE students pursuing certificate in education programmes.

Based on the information which she has provided me, I am thinking of working with students in your specialisation in the sites in Trinidad and Tobago during the January to May semester of the current academic year. The research project would involve observing students during on-line sessions, conducting interviews with them individually and holding about 2-3 group discussions.

I already know that there are eight students in Trinidad and Tobago. I also know the courses they will be taking during the upcoming semester. I will be grateful if you could let me know how these students are distributed over the three sites and what stage they are at in their studies.

I will greatly appreciate your cooperation in this venture and wish to assure you that I will make every effort to ensure that the research project does not unduly interfere with the running of the courses.

I intend to contact the local tutor at a later date and will welcome a brief letter of introduction in this regard. Thank you in anticipation and I look forward to hearing from you at the earliest opportunity.

Sincerely

Olabisi Kuboni (Ms.)

email: o.i.kuboni@open.ac.uk

14 November 1994

Ms.
Tutor
Certificate of Education

Dear.....

Little did either of us imagine when we ran into each other ... that we will be in touch with each other again in this way. Let me just give you some more detail about what I am doing. I am working towards my Ph.D in distance education and my research topic is interaction and learning in a distance education environment. What I want to do is examine the different types of interaction that take place in distance learning and see how distance students go about their studies. To investigate this topic, I intend to observe students directly as they engage in their studies, and I am planning to do this over an extended period of about three months.

I have already received permission to conduct this research project from [the] acting head of the Department of Educational Studies at Mona The project will involve observation of on-line sessions, interviews with individual students and one or two group discussions. I am planning to work with students in [specialisation A] Trinidad and Tobago during the January to May semester. I will therefore greatly appreciate your cooperation, in your capacity as local tutor for this programme.

In preparation for the project, there is some information which I would need to get and which I would like you to send me please.

1. The dates for the beginning and end of the second semester. The official university dates are Jan. 22 - May 20, 1995 but I do not know if the same dates apply to the UWIDITE Cert. Ed. programmes.
2. The duration of an on-line session and if possible, the days when these are held for [Option A]
3. How the students in this option are distributed across the three sites in Trinidad and Tobago. I'd also like to get the names of the students and their current employment. I intend to write to them individually. No need to send their addresses as I will like you to hand over the letters for me, please.
4. A brief overview of the courses being offered during the upcoming semester. Based on the correspondence that I received from Mona, I gather that these are:
Course A
Course B
Course C
Teaching Practice
Study

If you have the outline for the courses (objectives, summary of course content and assessment procedures) I would be glad to get same. I'd also like to get the names of those courses already completed.

5. Current status of the programme: how many semesters have been completed and when the programme is due to end. The handbook states that "the programme lasts for 4 semesters of the academic year" (p.13). I am not sure what that means since, as far as the University is concerned, there are 2 semesters each academic year. So please clarify this for me.
6. Finally, I'd like to get a brief idea of your role as local tutor.

I wish to assure you (and eventually the students when I write to them) that I intend to make every effort not to disrupt the running of the programme. My aim is to observe what is happening, not interfere with or even pass judgement on what is taking place.

I would really appreciate it if you could send me the information as soon as possible. ... I am really looking forward to working with you again.

Best wishes.

Sincerely

My name is Olabisi Kuboni and I am currently at the Open University, UK, working towards a Ph.D in distance education. In my substantive post, I am the lecturer in educational technology in the Faculty of Education, St. Augustine, Freetown that I used to be a teacher in the secondary schools in Trinidad and Tobago.

My Ph.D research area is information in a distance education environment and I am interested in looking at the way distance teachers and learners communicate with one another when engaged in some form of study. I have already received permission from the Department of Educational Studies at Monash as well as the UWI/DITC Coordinator at St. Augustine to undertake this research project with your group. I would therefore like to observe some of your on-line sessions which I would also like to videotape for subsequent study. I am planning to tape about six sessions over an eight-week period.

In addition to observation of on-line sessions, I would like to interview you individually on the same theme. I envisage that an interview session will last no more than one hour and I would like to have two such sessions with you over the 8-week period, at your convenience of course.

I wish to assure you that I do not intend to interfere in any way with the conduct of your studies; my role will be as an observer only. I also wish to state that as far as the arranging of interviews is concerned, I am prepared to fit myself into your schedule since I am fully aware of the demands that studying, work and your own family responsibilities must make on your time.

It is my hope that my research work can contribute to the development of teaching and learning in a distance mode within the Faculty of Education and the university as a whole. In particular in the light of the current thrust to expand the distance teaching aspect of the university's work. I also hope that the time we will be spending together will be a pleasant and rewarding experience for all of us.

I look forward to meeting with you and will contact you soon after I arrive on campus. Thank you in anticipation of your cooperation.

Sincerely,

Olabisi Kuboni (M.A.)

email: o.l.kuboni@open.ac.uk

13 February 1995

Dear

Research Project on Interaction in Distance Education

I am writing to seek your cooperation in the above-mentioned research project. Let me introduce myself first.

My name is Olabisi Kuboni and I am currently at the Open University, U.K. working towards a Ph.D in distance education. In my substantive post, I am the lecturer in educational technology in the Faculty of Education, St. Augustine. Prior to that I used to be a teacher in the secondary school system of Trinidad and Tobago.

My Ph.D research topic is interaction in a distance education environment and I am interested in looking at the way distance teachers and learners communicate with one another when engaged in some area of study. I have already received permission from the Department of Educational Studies at Mona as well as the UWIDITE Coordinator at St. Augustine to undertake this research project with your group. I would therefore like to observe some of your on-line sessions which I would also like to videotape for subsequent study. I am planning to tape about six sessions over an eight-week period.

In addition to observation of on-line sessions, I would like to interview you individually on the same theme. I envisage that an interview session will last no more than one hour and I would like to have two such sessions with you over the 8-week period, at your convenience of course.

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It is my hope that my research work can contribute to the development of teaching and learning at a distance both within the Faculty of Education and the university as a whole, in particular in the light of the current thrust to expand the distance teaching aspect of the university's work. I also hope that the time we will be spending together will be a pleasant and meaningful experience for all of us.

I look forward to meeting with you and will contact you soon after I arrive on March 8. Thank you in anticipation of your cooperation.

Sincerely,

Olabisi Kuboni (Ms.)